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MAGNETICAL AND METEOROLOGICAL OBSERVATIONS

MADE AT THE

GOVERNMENT OBSERVATORY,

BOMBAY.

1865-1870.

PRESENTED BY THE
SECRETARY OF STATE
FOR INDIA

MAGNETICAL AND METEOROLOGICAL OBSERVATIONS

MADE AT THE

GOVERNMENT OBSERVATORY, BOMBAY,

IN THE YEARS 1865 TO 1870.

UNDER THE SUPERINTENDENCE OF

COMMANDER G. T. ROBINSON, H.M.I.N;
CHARLES CHAMBERS, ESQ., F.R.S.;
AND
F. CHAMBERS, ESQ.

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1872.

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ERRATA.

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PREFACE.

The principal features of the present volume of the Bombay Observations are—that it exhibits for each of the six years 1865 to 1870—

1st. A detailed description, in the Introduction, of the organization of the Observatory, and of the instruments, modes of observation, and processes of reduction.

2ndly. The mean values of each of the various meteorological elements for each day, month, and year; and the diurnal variations in the mean values for each month, and annual variations for each year: the mean daily values, the mean diurnal variations for the year, and the annual variations being also represented by curves.

3rdly. The Absolute values of Magnetic Declination, Dip, and Horizontal Force as observed throughout the period; with the derived secular and annual variations.

It contains also—as Appendices—some discussions of special observations that have been published separately during the period; and some that have been prepared specially for publication at this time.

The deduction of normal values of the more important meteorological elements for each day of the year, and of periodical variations, by the combination of the observations of the last twenty-four years, is a separate work that is in progress, and, that it is hoped, will be completed and the results be ready for publication with the observations of the present year. And, as it would be a great waste of labour to repeat the computing operations for only a part of the series of years, nothing of this kind appears herein.

Being of opinion that any discussion of the scientific import of the observations should appear apart from the statement of simple matters of fact, which,—to facilitate the exact comprehension of their meaning,—accompanies the observations, the writer has avoided any such discussion in the "Introduction" to these Observations, but the separate papers which follow, as Appendices, may be regarded as examples of the form in which it appears to him desirable, as opportunity may serve, to combine considerable periods of observations and exhibit the results derived and the conclusions that follow.

In regard to what is faulty, in the earlier years, in the instruments or proceedings described, the writer would remark that it is only such faulty conditions that require any lengthy account, whilst those instruments and operations which are of a satisfactory nature are passed by with a brief statement that such is the case. Hence the reader would greatly misjudge the general character of the observations and proceedings of the Observatory if he assumed that those parts of them which call for the longest remarks are necessarily fair representatives of the whole, or are relatively of the greatest importance.

It is but just that I should express here my obligation and gratitude to the Kew Committee of the British Association, and to Dr. Balfour Stewart, F.R.S., for the great advantage they have conferred upon the Colaba Observatory, during my superintendency, by the procuring and testing for it of an almost entire new equipment of instruments. The examination which the instruments have undergone at the Kew Observatory has included an actual trial of them, in the manner in which they were ultimately to be used; and has been supplemented, where special apparatus was required for the purpose, by the determination of constants for use in the reduction of the observations: of the indispensable data thus supplied from Kew—and otherwise unprocurable without special expensive instruments—are the temperature and induction coefficients of the vibration magnet, the weight and dimensions of the inertia cylinder, and the errors of graduation of the deflection bar, used in observations for finding the Horizontal Magnetic Force.

In addition to the experience and skill required for these examinations, they demand a very considerable amount of careful and laborious observation : and the boon conferred by the British Association upon Observatories situated, like Colaba, far away from the artificers who produce the instruments they need, by the maintenance of the Kew Observatory, is indeed inestimable: and it cannot but be with the most lively satisfaction that the directors of such observatories—the number of whom who have been benefited is very great—observe that the prospect which recently threatened the dissolution of that institution has, through the munificence of an eminent member of the Kew Committee, ceased to exist.

I am much indebted too to the First Assistant of the Observatory, Mr. F. Chambers, for the zealous aid which he has afforded me during the last three years both in the general conduct of the Observatory, in its improvement by the adaptation of modern methods, and in the preparation of this book for the press. And I may mention that the self-registering rain-gauge devised by him, and which forms the subject of Appendix V. to this volume, supplies very satisfactorily a desideratum in our otherwise complete new equipment of instruments suited to the production of perpetual registrations.

CHARLES CHAMBERS,
Superintendent.

Colaba Observatory, Bombay,
December 1871.

DINGS

ATORY.

ude and Azimuth Instrument.
fice.

se.
h-House.

rters.
rs.

Room.
om and Shed.

Supporting Pillars of Instruments.

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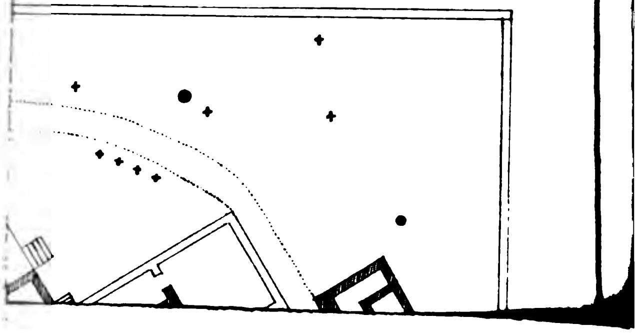

INTRODUCTION

TO THE

METEOROLOGICAL AND MAGNETICAL OBSERVATIONS.

1865 TO 1870.

The Bombay Observatory is situated at the extremity of a narrow strip of land extending two miles to the south-westward of the Fort of Bombay and separating the Harbour and Back-Bay. The nearest elevated ground is Malabar Hill, which lies on the opposite side of Back-Bay, at a distance of four miles, but that which subtends the largest verticle angle, as seen from the Magnetical Observatory, is the southern hill of the Island of Karanja, at a distance of about eight miles. The altitude of the highest point of the latter is less than 1° 7′. As the gradient of the fall from the ground level on the Western Ghauts and beyond, to the sea level at Bombay is little more than one in a hundred, the influence of the Ghauts upon the winds that reach Bombay from the seaward, which is the prevalent direction, must, so far as that influence depends merely upon their direct obstruction of the free passage of the air, be but small; and as the protection which the Ghauts afford to Bombay from winds which come from the further side of them, must depend upon that gradient,—being great for a large gradient, and small for a small gradient,—so it must be small in this case. The position of Bombay as a station for exhibiting the motions of the lower atmosphere—viewed on a grand scale—over a large district, corresponding to a particular stage of its progress, is therefore liable to but slight objection on these grounds.

The geographical position of the Observatory, deduced from Astronomical observations made on the spot, with instruments of inferior power and quality, and adopted until the 17th February 1871, is—

Latitude	18° 53′ 30″ North.
Longitude	$4^h\ 51^m\ 16^s{\cdot}32$ East.

The values recently adopted by the Great Trigonometrical Survey Department are—

Latitude	18° 53′ 45″ North.
Longitude	$4^h\ 51^m\ 25^s$ East.

These are dependent upon a new determination of the position of the Madras Observatory, which places it in Latitude 13° 4′ 5″ North, and in Longitude $5^h\ 21^m\ 9^s{\cdot}33$ East, and as they have been closely confirmed by Astronomical observations taken here in January and February of this year, with an instrument of suitable delicacy, they have been adopted, since the date mentioned, for the purposes of the Observatory. The observers whose voluntary labours have afforded this confirmation are Mr. F. B. Girdlestone, of the Great Trigonometrical Survey Department, and Mr. F. Chambers, the First Assistant of this Observatory.

A rough plan of the grounds and buildings of the Observatory, and an index showing the names and uses of the several buildings is given in Plate 1. Trees of large growth are scattered about the grounds, and occupy the places marked with black dots (●) on the plan, whilst a few smaller trees stand on the places marked with crosses (×), the remaining space being for the most part quite open.

Description of the Plan and Buildings.—The buildings marked **A** and **E** are the Astronomical and Magnetical Observatories respectively; the former is raised on a mound, the top of which is 10 feet higher than the basement of **E**, and from it there is a gradual decline on all sides reaching at the Tide Gauge House **O**, a maximum of about 30 feet. The block of buildings of which **A** forms a part has thick masonry walls, and the four arms of the cross consist of ground floor-rooms only—but with vaults underneath,—whilst upon the central square **C** is raised a cylindrical tower, surmounted by a wooden dome over which appeared—during 1865 and until July 1866—the Time Signal Ball and its supporting shaft; the machinery for raising and dropping the Ball occupied the upper rooms of the tower, which extends to a height of 50 feet above the ground. Since June 1867, Robinson's Anemometer has occupied the top of the dome, having a platform, 12 feet in diameter at its foot, partly to render the external parts of the machine accessible, and partly to prevent the formation near the instrument of irregular currents of wind glancing from the dome. On the eastern side of the room **A** is mounted the large Transit Instrument and the Standard Sidereal Clock. The pillars, formed of large blocks of stone, upon which those instruments rest, and whose foundations are independent of those of the buildings, are marked on the plan *i. i.* and *m*; that of the clock adjoins the eastern transit pillar. A small room **B**, adjoining the block **A. D. D. D.**, to the north of the transit pillars, contains a Collimator mark (for use with the Transit Instrument) mounted rigidly on a masonry pillar *n*. The remaining parts **D. D. D.** of the block are allotted as a dwelling-house to the Superintendent. In the large Magnetic Observatory, **E**, are four isolated masonry pillars marked *d. t. h.* and *v.*, upon which are mounted Grubb's Large Declinometer, a two feet Transit Telescope for observing the Declinometer, Grubb's Horizontal Force Magnetometer, and the Vertical Force Magnetometer respectively. In this room the observers sit, and the current Magnetical and Meteorological Registers are kept. Adjoining **E** at its north-east corner is a square tower **F**, 46 feet high, called the Electrometer Tower, on the roof of which has been placed, since the beginning of the monsoon of 1866, Osler's Rain-gauge, and from the beginning of 1866 till September 1867 the small Robinson's Anemometer was secured to an elevated post there. In the small Magnetic Observatory **G** there were, in 1865, pillars of stone, marked *a* and *b*, *c* and *d*, *e* and *f*, and *g*, supporting respectively the small Declination Magnetometer, its observing telescope; the small Horizontal Force Magnetometer, its telescope; the Vibration Apparatus, and its telescope; and the last one was unoccupied, having formerly been used for an Induction Inclinometer. In June 1870 the pillars *a* and *f* were removed to support the new Barograph in the Magnetograph room. The small erection **K**, standing to the northward of the small Magnetic Observatory, is used as an oil and lamp room. The room **N**, was used in 1865 as a store-room for old instruments and manuscripts, but in the year 1868 all the manuscript records, and printed volumes of observations were for greater security removed from that room, which is infested with white ants, to the room **M**, where they are now regularly examined and kept in order. The large room

M, to the westward of the Astronomical Observatory was formerly used as store-room and office for the Indian Naval Draughtsman's Department. Since the year 1866 this room has been used, instead of the large Magnetical Observatory, as a computing room ; thus removing a risk of slight accidental disturbance of the Magnetometers by keys and knives which the computers were in the habit of carrying about their persons, whilst placing the computers, at the same time, more continuously under the supervision of the Superintendent. In 1869 the western end of the room was partitioned off and fitted up as a photographic operating room.

All the buildings except the small Magnetical Observatory, and the hamals' and a portion of the assistants' quarters have substantial masonry or brick walls, and are preserved generally in a state of good repair. The roofs are mostly of red tiles, but that of the Astronomical Observatory is of wooden planks, covered with sheet copper, overlaid with chunam and gas tar. There is a planked roof to the Electrometer Tower in the shape of a low square pyramid, covered with felt and canvas, and it has over all a coat of white paint. The small Magnetical Observatory consists of a strong skeleton framework of wooden posts, the sides of which are completed to within a few inches of the roof with bamboo laths plastered over with mud; it has a cudjan roof, with provision for ventilation all round, but no ingress for light except the door. The present Thermometer shed **H**, which was erected in 1851, is situated 30 feet to the south-eastward of the large Magnetical Observatory.

Superintendence of the Observatory.—The observations of the years 1865 to 1870 have been taken under the superintendence of the gentlemen whose names follow, and during the several periods put opposite to their respective names:—

Leiut. W. L. Searle, H. M. I. N., F.R.A.S.—Till April 20, 1865.

Commander G. T. Robinson, H. M. I. N.—From April 20 to September 12, 1865.

Charles Chambers, Esq., F.R.S.—From September 12, 1865, to October 18, 1869.

F. Chambers, Esq.—From October 18, 1869, to December 31, 1870.

Observatory Establishment.—At the beginning of the year 1865 the Establishment of the Magnetical Department of the Observatory, which alone was concerned in the making of the observations dealt with herein, consisted of—

Naro Balcrishna	First Assistant.
Krishna Pandoorung	Second do.
Baboo Moreshwar	First Observer.
Gunesh Narayen	Second do.
Crishnajee Gunesh	Third do.
Narayen Ramchandra	Computer.

The following changes have since been made—

1. On the 16th February 1865 Krishna Pandoorung resigned the office of Second Assistant, and was succeeded by his brother Keshow Pandoorung.
2. On the 1st May 1865 Baboo Moreshwar resigned and Vishnoo Nilkunt became the Junior Observer.

3. On the 1st August 1866 Gunesh Narayen resigned and Ramcrishna Sukharam became Junior Observer.
4. In January 1867 Keshow Pandoorung resigned and Hurry Chintamon was appointed to act in his place.
5. On the death of Vishnoo Nilkunt in April 1867 Hurry Chintamon ceased to act as Second Assistant, to which office Crishnajee Gunesh succeeded, and Govind Dhondew and Toocaram Gunesh became respectively Second and Third Observers.
6. On the 16th May 1867 Naro Balcrishna accepted an appointment in the Judicial Department, and for a time three Junior Observers and Computers were employed in lieu of the First Assistant, until a suitable successor should offer his services for that office. This did not occur till September of the following year, when the establishment list stood as follows—

Purshram Luxooman..............	Observers and Computers, in lieu of First Assistant.
Vinayek Narayen	
Narayen Sudasew	

Crishnajee Gunesh	Second Assistant.
Ramkrishna Sukharam............	First Observer.
Govind Dhondew.................	Second do.
Toocaram Gunesh................	Third do.
Narayen Ramchandra	Computer.

Mr. F. Chambers was apppointed First Assistant from the 1st October 1868, and Narayen Ramchandra retiring on pension in August 1870 was succeeded by Purshram Luxooman; with these substitutions the last list will apply also to the end of the year 1870.

For the period from 18th October 1869 to 7th January 1871, when the Superintendent was absent on sick leave to England, Purshram Luxooman and Vinayek Narayen again acted in lieu of the First Assistant.

There are two Assistants of the Astronomical Department who have held their offices throughout the whole period from 1865 to 1870, viz :—

Govind Ramchandra	First Assistant.
Hurry Chintamon................	Second do.

System of observation and reduction and distribution of duties.—In 1865 the duties in the Magnetical Department of the Observatory were distributed in the following manner:—

The hourly Magnetical and Meteorological observations were taken and entered in the registration forms by the observers in rotation in three periods, of 4 hours' duration, in every successive half-day; and in the intervals between successive hourly observations the observers copied the observations of each element into tables, having the days of the month marked in numerical order in the first column, and the hours of the day in order at the head of the columns; and computed the daily mean values and the monthly mean values for each different hour. The computer also took part in the latter operations; in this stage the reductions passed into the hands of the Assistants, who deduced from them the tables of results; these were prepared according to a nearly uniform plan which had been long followed, and had become part of the fixed routine of the establishment. The First and Second Assistants made also the regular observations of Magnetic Dip and Horizontal Intensity, which were taken—the former twice a week, on Tuesdays and Fridays—and the latter, Deflection and Vibration experiments, generally every Saturday—and upon the First Assistant devolved the immediate oversight both of observers and instruments and the general control, under the Superintendent, of the Department; he was also charged with the preparation of the manuscript of the results of observations for the press. The hourly Magnetical observations commenced every week at noon on Sunday and concluded at 11 A.M. on Saturday, Göttingen Civil Time. The Meteorological Observations commenced at 12 P.M. on Sunday and concluded at 11 P.M. on Saturday, Bombay Civil Time. The exclusion of Sundays from the hourly observation days, since the commencement of the Observatory, is in accordance with the instructions of the Committee of Physics of the Royal Society; but it should have been the local Sunday both for the Magnetical and Meteorological observations. Although the special reason for the observance of Göttingen Time may no longer exist, yet as any twenty-four equi-distant times will serve equally well with any other twenty-four for determining the character of a diurnal variation; no disadvantage can attend its use other than the inconvenience to the observer, who loses by the arrangement described eight hours of freedom every Sunday; accordingly while retaining Göttingen Time in 1866 and thereafter, partly for the sake of uniformity of system and partly because of the impossibility of making the hourly readings of all the instruments, Magnetical and Meteorological, at the exact hour, the week has been made to commence on Sunday at 8 P. M. of Göttingen mean time, so that now the observer gets his full Sunday of rest, a matter of no slight importance when the confining nature of the employment is considered. Besides Sundays the only other days on which the hourly record was stopped were about eight Government holidays in each year. Since the beginning of the year 1866 the hourly Magnetical and Meteorological observations have been taken and entered in the registration forms by the observers in rotation in periods of about six hours duration each, as follows:—

		h. m.		h. m.
1st.	From	9 40 A. M.	to	4 40 P. M.
2nd.	From	4 40 P. M.	to	10 40 P. M.
3rd.	From	10 40 P. M.	to	3 40 A. M.
4th.	From	3 40 A. M.	to	9 40 A. M.

The reduction of each hour's observations is made immediately after the entry of the observations in the register, and among the duties of the observer from 9^{h} 40^{m} A. M. to 4^{h} 40^{m} P. M. are included the checking of the previous day's reductions, the calculation of daily averages, and the writing out of the monthly abstracts.

The three observers who take the 2nd, 3rd, and 4th stage observations attend office daily for computing duty from 11 A. M. to 2 P. M. The First Assistant, upon whom devolves the immediate oversight of general observing and computing operations, and since 1869 of photographic operations, and the Computer attend office daily for computing or other duty from 10 A.M. to 4-30 P.M. The Second Assistant and First Observer take alternately observations of the Absolute Declination, Horizontal Intensity, and Dip, which are repeated once, twice, and twice respectively every week. Since 1870 the time of the Second Observer has been almost wholly absorbed in attending to a set of Magnetographs which were brought into use in that year and have since been maintained in continuous action, and the former duties of his office have been fulfilled by the Computer.

Every operation performed by one Computer is regularly gone over a second time by another.

The purpose served by the Astronomical Department is mainly the determination of correct time, which is publicly signalled every day (except Sundays) at 1 P. M.

The Assistants make frequent observations of the meridian passages of stars, or of the sun when stars are not visible, with the Large Transit Instrument and calculate the error and rate of the Standard Clock. The adjustment of the Transit Instrument is frequently tested by reference to the fixed collimator mark in the room (**B**); the collimation, level, and azimuthal errors are determined from time to time, and whenever the collimator shows a displacement of the telescope or any considerable discordances appear in the clock-errors derived from stars of different North Polar distances. But before September 1865 the collimation error was made as small as possible, and then assumed to be negligible, no correction being applied. Until the 24th July 1866 the Assistants regularly dropped the Time Signal Ball over the Tower of the Observatory: the Ball was then removed to the new Tower in the Fort and the signal was continued, till its erection was completed, by dropping a flag in lieu of the Ball. Time was the only element contributed by this Department till 1867, towards the published observations, and this for ordinary purposes was furnished in 1865 and 1866 to the Magnetical Office through the usual daily signal, and from 1867 onward by regular comparison of chronometers three times a week. Since the 1st July 1867 the Assistants have also attended to Robinson's Anemometer, changing the recording paper daily, except on Sundays, when the observer of the Magnetical Department who was detained for the making of special observations, if needful, also renewed the recording paper of the Anemometer.

Instruments and Phenomena observed hourly.—The indications of the following instruments were read every hour in the order and at the minutes stated opposite to each:—

Newman's Rain Gauge (in wet season)....	From 5 to 7 minutes.	After the hour, Bombay Civil Time.
Air Thermometer		
Wet Bulb Thermometer		
Thermometer in ground 1 inch deep		
Do. do. 9 inches deep		
Two Standard Barometers	From 7 to 9 minutes.	
Vertical Force Magnetometer and its Thermometer	At 10 minutes.	
Large Declination Magnetometer	At 12 minutes.	
Large Horizontal Force Magnetometer and its Thermometer	At 14 minutes.	

The direction and force of the wind, description and extent of clouds, and general state of the weather were observed between 5 minutes before and 5 minutes after the hour; but after the end of 1865, when the velocity of the wind began to be automatically registered, the estimations of force of the wind were discontinued.

Since the beginning of the monsoon of 1867 Osler's Rain Gauge has also been read hourly immediately before the reading of Newman's Gauge. Thermometers, with their bulbs respectively 20 and 60 inches below the surface of the ground, were read once a day, viz. at 1 P. M.

From the beginning of 1866 the hourly observations, Magnetical and Meteorological, were commenced every week at 12 P.M. on Sunday, and concluded at 11 P.M. on Saturday, Bombay Civil Time, but the reading of the Rain Gauges was since July 6, 1867, continued till 12 P.M. on Saturday.

The following are all the recorded irregularities in the hourly observations:—The observations of 1866 January 16^d 4^h, March 16^d 4^h and 5^h, and 1870 September 5^d 0^h were omitted; and those of 1866 September 1^d 10^h, 1867 June 10^d 0^h and 1868 October 12^d 0^h and 21^d 21^h were taken too late by 15, 34, 41, and 16 minutes respectively. The rain-fall of 1867 July 16^d 12^h to 13^h (Newman's Gauge) was erroneously taken as 0·16 inch instead of 0·18 inch. The Air Thermometer and Wet Bulb Thermometer being under comparison on the 4th December 1865, the readings for 15^h were interpolated.

Remarks on the Condition and Adjustments of the Instruments and on the Processes of Reduction.

The object of the following descriptions is to make known such special circumstances in connection with the condition, situation, and adjustment of the instruments; with the habits of the observers, and with the routine of the processes of reduction, as are necessary to enable the reader to form an independent judgment of the degree of precision attained, and of the weight to be attached to any conclusions that may be drawn from the observations.

I. METEOROLOGICAL INSTRUMENTS.

Barometer.

Description.—The observations which have furnished the data for the construction of the tables of Barometric pressure contained in this volume were taken with a Standard Barometer by Newman, marked No. 58, the same which has been used uninterruptedly since the establishment of the Observatory. The internal diameter of the Barometer tube, marked by the maker on the frame of the instrument, is 0·530 inch. The scale, which is of brass, is moveable and terminates below in an ivory point, which is carefully brought down by turning a slow-motion screw to the surface of the mercury in the cistern, and the point is known to be accurately in contact with the surface by its appearing just to meet its image reflected from the mercury. The upper part of the scale, which is divided to twentieths of an inch, has a vernier with slow motion screw, reading to thousandths of an inch, and to it are attached two small brass plates with horizontal lower edges before and behind the tube: the setting of the instrument consists in raising and lowering the vernier until the horizontal plane containing these two edges is tangent to the surface of the mercury in the tube of the Barometer, and this is the case when it is just so low, and no lower, that when the eye is raised and lowered no light is seen to pass between the central part of the mercurial surface and the two edges. A Thermometer with a cylindrical bulb dipping into the mercury in the cistern, is attached to the Barometer, and is read at every observation.

The Standard Barometer is attached by means of brackets to a flat board which hangs against the wall on the eastern side of the large Magnetical Observatory, near the north-east corner of the room, and its cistern has an elevation of 37 feet above the mean sea level at Colaba. It was lifted down in May 1866 and the mercury carefully caused to run up to the top of the tube, where it gave the sharp metallic stroke that is indicative of a good vacuum. It is also stated in the "Report of the Committee of Physics of the Royal Society, 1840," page 56, where a description is given of a class of Barometers of which this is an individual, that the scale is laid off from the zero point from an authentic standard. There is no reason to presume, therefore, that the absolute pressures observed with it differ very sensibly from the true pressures. Care is taken to preserve unchanged the adjustment of the instrument to verticality.

Error in setting the zero-point of the scale.—In the long period that has elapsed since the instrument was mounted there has been a gradual accumulation of scum on the surface of the mercury in the cistern, and the glass cistern has become more and more opaque, until at the present time the reflected image of the ivory zero-point of the scale is very obscurely seen, so that the operation of setting the zero of the scale is uncertain to a very sensible degree. It was found from observations given on page XXVII. of the "Introduction to the Bombay Magnetical and Meteorological Observations for 1864" that although an individual observer would make successive independent readings of the instrument which were consistent amongst themselves, yet that, owing to indistinctness in the reflection of the pointer, different practised observers differed from each other as much as ·026 inch.

Change of method of observation.—For this reason the method of observation, which had always previously been in accordance with the above description, was changed on the 22nd May 1866, so as to avoid the necessity of setting the scale at every observation. The scale was set once for all on that day and the setting screw then removed; and suitable corrections were thereafter applied for the rise and fall of the mercury in the cistern. To determine the relative capacities of the tube and cistern the maker's value (0·530 inch) of the internal diameter of the tube was adopted as correct; and the internal diameter of the glass cistern and external diameter of the part of the tube dipping into the mercury were assumed to be the same as those of the same parts of a similar broken Barometer by the same maker;—these were respectively 2·632 inches and $\frac{2{\cdot}05}{3{\cdot}1416}$ inch. Hence an apparent rise of 1 inch as shown on the Barometer scale will correspond to a real rise of $(1+\frac{(0{\cdot}53)^2}{(2{\cdot}632)^2-\frac{(2{\cdot}05)^2}{3{\cdot}1416}})=1{\cdot}04321$ inch, and an apparent fall of 1 inch to a real fall of $1-{\cdot}04321$ inch; and the capacity correction will be ·004321 (h_o-h), h_o being the observed reading, and h the reading for which the scale is correctly set. In order to set the scale so that the capacity correction should be nothing when the Barometric pressure and temperature of the instrument have their mean values, the following means were adopted: First, a series of hourly comparisons was made with the Standard Barometer No. 58, and a similar barometer No. 51 by the same maker, the mercury and cistern of which were rather cleaner than those of No. 58: the daily means, corrected to temperature 32°, of these hourly readings for seventeen days showed that No. 58 reads on the average ·011 inch lower than No. 51.

Now the mean barometric pressure is nearly 29·800 inches at temperature 32°, or 29·943 at 82°.0 the mean temperature of the room in which the barometer is placed; and at the time the scale was permanently set the mean of four readings of No. 51 taken by different observers was 29·930: therefore the two barometers being similarly placed alongside of each other, and having the same temperature (about 87°.6) the reading of No. 58, corrected for capacity, must be ·011 less than 29·930, or 29·919: but the correction for capacity = ·043 (29·919 — 29·943) = —·001; hence the uncorrected reading of No. 58 must be made 29·920 by first placing the vernier so that its setting plane is tangent to the surface of the mercury in the tube, and then adjusting the scale by means of the lower screw, to that reading. The scale was set to 29·914, and a *suitable* table of corrections constructed which was used till noon on the 25th May 1866, when the scale was made to read ·006 higher, and a table of capacity corrections was used thereafter calculated by the formula:—

$$\text{Correction} = \cdot 04321\ (h_0 - 29\cdot 943).$$

As the departure of the barometer reading from its mean value very rarely reaches 0·4 inch, which would require a correction of only ·017 inch, it is very improbable that an error of so much as ·001 inch ever occurs from inaccuracy in the adopted value of the relative capacities of the tube and cistern: since the change was made, the comparability of the observations for showing variations is therefore throughout much better secured, whilst the comparability of the absolute pressures with those observed in previous years is also retained.

Steps have been taken for procuring from England a Standard Barometer, modified in construction so as to permit of the occasional cleaning of the cistern and of the surface of the mercury contained in it.

Corrections applied to the observed readings.—It was stated in the instructions given in the Report of the Committee of Physics (page 56), that the correction for capillary action in barometers of this description is rendered inappreciable by the large diameter of the tube. Consequently no correction for capillarity has ever been applied, and the only corrections besides those for capacity, which have been applied, and that invariably from the first, are for reducing the observations to what they would have been if the temperature of the mercury and brass scale had always been 32° Fahr., and these corrections were taken from Table II. of the Committee's Report.

DRY AND WET BULB THERMOMETERS.

Description of Air Thermometer.—The maker's name "Newman" is marked upon this instrument, but no number: it is a mercurial thermometer, with a nearly spherical bulb about 0·55 inch in diameter, and is on a brass frame which is divided to two-tenths of a degree: the range is from 5° to 115° measuring 12·88 inches. Until 3½ P.M. on the 5th December 1865 the thermometer was surrounded by a wooden box-frame with a glass window in front and with holes to admit the air at each side of the bulb, but at that time the frame was removed and the bulb has since been fully exposed to the air.

Description of Wet Bulb Thermometer.—This is also a mercurial thermometer by Newman (without number), and has a spherical bulb 0·53 inch in diameter: its frame is of brass and is divided to degrees with a range from 10° to 133° measuring 5·41 inches. The bulb is covered with muslin, and is kept moistened by the capillary action between a small vessel of water near the thermometer bulb and a bundle of fine cotton yarn, which dips into the water and passes loosely round the thermometer stem just over the bulb.

Errors of graduation.—Experiments, made in December 1865, for the purpose of determining the errors of these two thermometers are described on page xxix. of the "Introduction to the Bombay Observations for 1864," and gave the following results.

Table I.—Corrections required to be applied to the Readings of the Dry and Wet Bulb Thermometers used in making the ordinary hourly observations.

Observed.				Adopted.			
Dry Bulb.		Wet Bulb.		Dry Bulb.		Wet Bulb.	
At Temperature.	Correction.	At Temperature.	Correction.	Between Temperatures.	Correction.	Between Temperatures.	Correction.
°	°	°	°	° °	°	° °	°
32	—0·2	32	—0·1	50 and 61·9	—0·6	44 and 52·9	0·0
56	—0·6	49	0·0	62 and 87·9	—0·7	53 „ 53·9	—0·1
68	—0·7	51	0·0	88 and above.	—1·0	54 „ 55·9	—0·2
71	—0·7	56	—0·2			56 „ 56·9	—0·3
82	—0·7	59	—0·5			57 „ 57·9	—0·4
94	—1·0	62	—0·6			58 „ 58·9	—0·5
		72	—0·7			59 „ 66·9	—0·6
		82	—0·8			67 „ 76·9	—0·7
		94	—1·0			77 „ 87·9	—0·8
						88 and above.	—1·0

As no authenticated Standard Thermometer existed in the Observatory, the above corrections depended on the assumption that two thermometers by Murray and Heath, whose errors had been found at the Kew Observatory, could be used safely instead: the Superintendent has since been presented with a Kew Standard Thermometer, and comparisons made with it and the two by Murray and Heath show that the assumption was quite allowable, for the corrections adopted for the latter instruments were — at six points ranging between 32° and 92°—always within 0°·1 of the truth.

These corrections have been applied to every individual observation made since the 1st January 1866; but for the year 1865 a constant correction of —0·7 has been applied to the monthly and annual means of temperature of the air only.

Situation of Thermometers.—The Thermometers have been placed, since 1851, in a roomy shed, 430 feet to the south-eastward of the Magnetical Observatory. It has a cudjan roof and open sides, supplied with shutter frames, which are covered with bamboo matting, and swing on hooks vertically; the shutters are propped open at an angle of about 40° from the vertical: the floor, which is of red earth, is raised a few inches to prevent any flow of rain into the inside of the shed during the wet season; and the north-eastern and south-western corners of the shed are protected by strips of bamboo matting against the ingress of direct rays of the sun in the morning and evening; the south-eastern corner is sufficiently protected by the over-hanging branches of a mangoe tree. The shed is 12 feet square, and 14 feet high to the highest point of the roof. Till 2 P. M. of the 20th January 1866, the Dry Bulb Thermometer was suspended by a hook from the roof, with its bulb at a height of 4 feet above the middle of the floor; and the Wet Bulb Thermometer stood upon a light table, with its bulb 2 inches above the top of the table, and 2½ feet from the ground. For more effectually cutting off any direct breeze from the Wet Bulb Themometer, and or the better protection of other thermometers in constant use from solar radiation, they were, early in January 1866, mounted on light wooden rods inside an open cage with venetian sides, and depressed venetian bottom; the cage was supported by four corner posts which entered the ground, leaving its open bottom at a height of 3 feet, and the bulbs of both thermometers 4½ feet from the soil; the dimensions of the cage are 3 feet square and 5 feet high, and the roof is completely closed; the position occupied by it is the middle of the old thermometer shed. This description of thermometer stand, which was devised by the late Mr. Welsh for the Kew Observatory, has been in use there for many years, and is found to afford a free circulation of air, and at the same time to answer well the other objects in view.

GROUND THERMOMETERS.

Throughout the period of six years (1865 to 1870) thermometers with their bulbs at the respective depths below the surface of the ground of 1, 9, 20, and 60 inches, have been regularly observed; the two former hourly and the two latter daily at 1. P.M. They are all by Newman, of London, and are divided on brass scales, and the values of one division; approximate range of part of scale exposed above ground; and length of that part; and of one average degree are shown below:—

Depth of Bulb.	Divided to	Approximate Range of exposed part of Scale.	Length of that Range.	Average length of 1°
			inches	inches
1 inch	1°	30° to 145°	8·19	·071
9 „	0°·2	70° to 115°	5·20	·116
20 „	1°	35° to 160°	6·73	·054
60 „	1°	35° to 160°	6·81	·054

The 1-inch and 9-inch Thermometers are on flat brass scale-frames which lie against wooden posts in the ground, and have their bulbs in contact with the loose red earth which fills the holes in which they are placed; the 20-inch and 60-inch Thermometers have their lower parts enclosed in brass tubes with ends curving off to a point and the upper parts are in wooden box frames to which the brass scales are fixed. The reason why only one observation is made daily of the two deeper thermometers is that it had been found by hourly observations in 1849, 1850, and 1851 that no appreciable diurnal variation of temperature reached the depth of 20 inches. As the records left it somewhat doubtful whether the depth of the bulb of the so-called 9-inch Thermometer was really 9 or 6 inches, the earth about the thermometer was scraped away on the 15th March 1871 till the bulb became visible, when it was found that the depth of nine inches would be correct if the ground level reached up to the division 74° on the scale : after the examination (at 3½ to 4½ P.M.) the ground level was raised to this division ; but before, it only reached up to the division 69°, which makes the actual depth of the bulb before March 15, 1871, only 8·4 inches: the difference of 0·6 inch is probably owing to natural subsidence of the loose soil since the instrument was placed.

ANEMOMETER.

For the year 1865 the observations made use of to form the Wind Tables XXI. to XXV. are the hourly estimations of direction and pressure made by the observers. These estimations were made from the ground, where the obstructions that exist to the free course of the wind are very considerable, and it was the common practice to refer to and depend chiefly—in estimating the direction—upon the observed position of Osler's Wind Vane : consequently, as the vane was a very imperfect indicator, responding only, by reason of its want of delicacy, to winds of considerable power, the observations are less reliable than could be desired ; moreover the situation of the vane which was on the roof of the Astronomical Observatory, and overlooked on the eastward by the Time Ball Tower, was not favourable for allowing at all times an unobstructed and unchanged action upon it of the actual wind that was blowing.

During the year 1866 and until June 30, 1867, the observations of directions of the wind were taken hourly by the observers from the roof of the Electrometer Tower, a position at which a strip of cotton tied to a stretched cord acted as an indicator, and which was free from obstructions in every direction ; and the velocity of the wind was determined from the hourly readings of an instrument attached to a post on that tower, and raised also above any obstructions to the free access of the wind, and 46 feet above the ground. The instrument was one designed for the measurement of the strength of water-currents, which was converted into a small Robinson's Anemometer with a set of four hemispherical cups: the cups were attached in the usual manner at the end of four rectangular arms branching from the top of a spindle, which at a lower position is formed into an endless screw gearing into two wheels which work independently on the same axis, and have respectively 251 and 252 teeth. The one wheel is divided into 12 parts and eighths of a part, and is read by an index fixed to the other wheel, the face of which is divided into 252, parts and is read by an index fixed to the frame of the instrument. The wheels are 3 inches and the cups 1·75 inches in diameter, and the centres of the cups are 4·5 inches above the centre of the wheels and 2·61 inches from the axis about which they revolve. The readings of both wheels were taken and entered in the register every hour, and were at once converted by means of a suitable table into revolutions of the foremost wheel of which one revolution corresponds to 252 revolutions of the cups. To find the value of one such revolution in miles of movement of the wind, comparisons were made of the total number of revolutions made in twenty-four hours with the total number of miles which the wind moved over—according to the indications of a large Robinson's Anemometer, to be presently referred to—in the same identical period: and the ratio of the latter number to the former was taken for 69 days between the 3rd June and 20th September 1867 with the following results:—

For 16 days during the month of June the ratio = 0·45
„ 18 do. July do. = 0·47*
„ 20 do. August do. = 0·43
„ 15 do. September do. = 0·45

For 69 days between 3rd June and 20th September the ratio = 0·45

The greatest and least ratios for individual days of the 69 were 0·55 and 0·37 respectively. The hourly differences of the readings of the small anemometer have therefore been converted into miles of movement of the wind by multiplying them by the constant factor 0·45. The instrument is all of brass, except the endless screw and a small screw (connecting the two indicating wheels) which are steel, and which being always fully exposed to the weather were very liable to become rusty, rendering it necessary to clean and oil the instrument somewhat frequently; rarely, however, more than once in a week even during heavy rains. However light the wind, the cups were nearly always in motion, and the consistency of the factors, shown above from different months' observations indicates a satisfactory degree of constancy in the state of the instrument; although undoubtedly its motions were somewhat freer immediately after cleaning and oiling it than when the oil had become thickened by exposure. The cleaning was generally done so as to lose as little as possible of the time between two hourly observations, but occasionally two or more hours' observations were lost; at such times the missing or imperfect values were substituted by interpolations from those of the preceding and following observations, or the whole day's observations were excluded in taking the monthly averages. On the 25th August, 1866, one of the cups, which had become partly detached from its arm, was soldered on afresh.

On the first page of Appendix I. to this volume, appears Dr. Robinson's rule for calculating the velocity of the wind from the observed velocity of the cups of anemometers constructed on his principle; this rule is simply to take three times the velocity of the centres of the cups, whatever be the size of the cups and whatever the length of the arms to which they are attached. The rule does not appear to hold good with regard to very small instruments, since if it did, the above ratio (0·45) should have been rather less than 0·2; and if the rule be three times the movement of the cups when the centres of the cups are 24 inches from the centre of the axle, and their diameters 9 inches, it should be very nearly seven times that movement when they are of the small dimensions described above.

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* An error in the calculations has been discovered, since the year's tables were all completed, which makes this number somewhat too great, but it does not sensibly affect the adopted factor 0·45.

ROBINSON'S ANEMOMETER WITH BECKLEY'S IMPROVEMENTS.

Since the beginning of June 1867 the instrument described in Appendix I. has been in regular operation, and after the 30th June has been depended upon solely for the determinations of direction and movement of the wind used in the compilation of the tables XXII. to XXVIII. for the year 1867 and the corresponding tables of later years. This instrument is erected on the old Time Signal Tower, at a height of 53 feet above the ground, over a platform, 12 feet in diameter, which is designed to give ready access to the instrument and to protect it from irregular currents of wind glancing from the convex surface of the dome. The centres of the hemispherical cups are 3½ feet above the platform, and the length of the vertical light brass tubes which connect the recording apparatus with the upper part of the instrument is 140 inches. The instrument was stopped for the purpose of being taken to pieces and cleaned and oiled on May 9th 1868, and on May 18—19, 1869. The total number of full day's registrations rejected from all causes were in 1867 *six* days, in 1868 *five* days, in 1869 *five* days, and in 1870 *three* days. The total number of hours when the registrations failed were in 1867 *sixty-six* hours, in 1868 *one hundred and ten* hours, in 1869 *forty-five* hours, and in 1870 *forty-three* hours. The treatment of the observations is fully described in Appendix I. The hourly estimations of direction have been continued, but the observers were relieved after the 30th June 1867, when Robinson's Anemometer was in satisfactory operation, from the labour of ascending to the top of the Electrometer Tower; and from the 1st February 1868 they were aided in making the estimations by observing the positions of strips of cotton—one weighted—tied to a cord which was stretched across, at an elevation of about 40 feet, from the balcony of the Electrometer Tower to a palm tree about 150 feet to the south-south-west of it.

RAIN GAUGES.

Newman's Rain Gauge.—This instrument is made of brass and exposes for the collection of rain-drops a circular surface, of nearly 12 inches in diameter, forming the top of a funnel that carries the rain into a cylindrical vessel below having a diameter of 5·732 inches: a float of slightly less diameter, so as to rise and fall freely, rests upon the water in this vessel, and having a wholly convex external surface, it allows the rain as it falls, to flow off and raise the level of the water and with it the float; to the middle of the float is fixed a wooden rod graduated with divisions, each of which represents approximately ·05 inch of rain; and the readings of this scale which are easily estimated to fifths of a division are made where it is cut by the upper edge of a light brass rod placed horizontally across the mouth of the funnel but half an inch below the edge of the exposed circular surface; the scale passes through a hole in the middle of the horizontal rod and is thus kept always in a vertical position. The range of the scale is from 0 to 4·00 inches, and it was customary before the 13th June 1866 to empty the gauge, by means of a brass cock at the bottom, at every hourly observation, or rather to let out enough water to bring the scale down to the zero: this was however a somewhat doubtful operation since the float rested at the bottom of the vessel when the reading was *nothing*, whilst a fall of five hundredths of an inch of rain was necessary to sensibly raise it, and if too much water was let out there was no change in the position of the scale to indicate the fact. But since the 13th June 1866 the readings of the scale have been entered in the Meteorological register, and the differences taken for every interval of an hour; and the rain has accumulated in the vessel till 11 P.M. on every Saturday or till, from heavy rainfall, the reading had risen generally to somewhere above 2·00 inches, when the water was let out of the vessel till the scale read, *not nothing* but 0·05 inch, at which point if too much water was let out the operator became aware of it and added a quantity to restore the proper reading: this reading was also maintained during intervals of dry weather—when from evaporation the scale would otherwise have fallen lower by pouring water into the gauge.

Until the 6th July 1867 the rain gauge was read on Saturdays at 11 P.M. and next, unless there was a considerable fall on the Sunday, at 12 P.M. on Sunday, but to render the records complete for every civil day in the year the readings were taken from that date at 12 P.M. on Saturdays also.

Newman's Gauge stood, on three feet attached to it, on a large rectangular block of stone near the southern wall of the Magnetical Observatory, with its circular mouth raised 4½ feet above the ground. The roof of the Observatory having an elevation of about 32° above the mouth of the gauge in that position, it was considered advisable to remove it to a more open spot, where no obstructions would lie within a considerable distance of it, and this was accordingly done before the commencement of the rains of 1866, some trees that lay in the immediate neighbourhood having been cut down to prepare the new place. On the 2nd May 1866 the mean of several measures of the diameter of the circular surface exposed by Newman's Gauge was found to be 12·008 inches, and there is no mention in the Observatory records of its having been altered at any time previously. On the 25th June, and 5th July 1866, however, and again on the 14th May 1867, the gauge was found to have been knocked down off its support and the exposed surface was altered thereby on the two latter occasions, giving mean diameters of 12·026 inches and 12·035 inches respectively. Immediately after the latter date the precaution was taken to have the feet of the gauge embedded with lead in holes cut in its stone support. At the close of the year 1868 the gauge with the stone slab upon which it stands had to be removed out of the way of the new Magnetograph room and it was placed near the middle of an open space of ground lying between the entrance gate, the small Magnetical Observatory, and the small dome. A tree which would have overlooked the gauge in this position had to be cut down; and an enclosure of light bamboo railings on wooden posts of the same height as the gauge was made to prevent the possibility, in so exposed a position, of an unobserved stranger meddling with the instrument. In effecting this removal the measuring scale was accidentally broken and a new one had to be made, the divisions of which were made of a different length from those of the old scale with the object of avoiding the necessity of thereafter applying any correction to reduce the registered fall of rain to true inches. After the time the reading to which the scale was set on discharging the gauge was 0·10 instead of 0·05 as before. This change was rendered necessary because the zero of the scale on the new wooden rod was slightly higher than on the old one.

Again on the 8th June 1870, the erection of the new Thermograph room somewhat near to the rain gauge, rendered it advisable to remove the latter further away; and it was accordingly removed, with its enclosure, about 28 feet to the south-westward of its former position. There was only one day of heavy rain—the previous day—before the removal, and on that day the wind was not at all from the direction of the

Thermograph room; consequently the records are probably not at all affected by the erection of the new building. In the present position the altitude of the highest neighbouring object, as seen from the gauge, is about 30°; and before the last removal, it was a little less. Experiments described on page xxxi. of the "Introduction to the Bombay Observations for 1864" gave, as the factor for converting the rainfall as registered by Newman's Gauge into absolute measure in inches, 0·977. The experiments were made in May 1866 when the mean diameter of the surface exposed was 12·008 inches: taking account of the changes in the extent of this surface described above, the factors adopted for the different periods are—

From January 1, 1865, to July 5, 1866, the factor =0.977
,, July 5, 1866, to May 14, 1867, do. =0·974
,, May 14, 1867, to December 31, 1868, do. =0·973

These factors have been applied. The new wooden scale was inadvertently made to suit the surface exposed during the period from July 5, 1866, to May 14, 1867, and there is consequently a slight error of *one thousandth* of the whole rainfall in the records for the years 1869 and 1870: this it has not been thought needful to correct.

Osler's Rain Gauge.—The rainfall has been recorded since the establishment of the Observatory and until 1866, as well by an automatic instrument forming a part of Osler's Wind and Rain Gauge as by Newman's Gauge. Until the end of the year 1865 Osler's Gauge was placed on the roof of the Astronomical Observatory with its exposed surface for the collection of rain at a height of twenty-six feet above the ground, and the recording apparatus in the room below. The collecting vessel is rectangular in shape, but in May 1866 it was found on examination to be somewhat distorted, and exposed a surface of 197·87 square inches: it was supported on a pyramidal skeleton framework of teakwood: the lower part of it is funnel shaped, running into a brass pipe which discharges at its lower end into a graduated glass receiving vessel suspended by springs from the framework of the recording apparatus: as the water accumulates in the vessel the springs are distended and the vessel descends till it is nearly filled, when a syphon arrangement within it comes into action, and quickly empties the vessel, and brings it back to its zero of depression. The glass vessel is connected by a thread which passes over a pulley, with a radius bar that carries a pencil in such a way that the pencil approaches the vessel as the vessel fills, and marks its progress on a paper underneath it, which has lines printed on it indicating approximately hundredths of an inch of rain up to twenty-five hundredths, this being the quantity which must fall before the syphon empties the vessel. The paper is also marked with hour lines at right angles to the lines which form the scale, and it is fastened to a flat board which, being suitably connected with a clock, is carried along uniformly over twenty-four hour spaces in one day. By this arrangement the trace of the pencil on the paper informs us what quantity of water there is in the graduated vessel at any moment, and how many times it has been filled and emptied during the day. From 1st to 17th August 1865 the instrument was under repair. In the year 1858 a tower was raised on the east side of this instrument, for the Time Signal Ball, forming an objectionable obstruction to the free course of the wind, or causing a deviation of the wind in the neighbourhood of the gauge. The vertical and horizontal angles subtended by the tower at the gauge were respectively 40° and 42°. On this account the instrument was removed before the commencement of the rains of the year 1866 to the Electrometer Tower, where the rectangular funnel was supported on a frame with four teakwood posts, projecting from the roof of the tower, and raising the exposed surface above the highest point of the roof: and the recording apparatus was placed in the room immediately below. The height of the gauge in this position above the ground is 46 feet. Up to the end of the monsoon of 1866, the quantities of rain in the measuring vessel were generally read or marked on the registration paper at the time of changing the paper, which was done every day at noon. In the course of the monsoon of 1866 it became very evident that the recording apparatus was untrustworthy, for the pencil traces often failed, and, owing to friction of the measuring vessel and irregularity in the action of the springs, the indications were far removed from correspondence with the quantities of rain contained in the vessel in the process of filling; so much so, that, after emptying, nearly 0·1 inch of rain had to fall before the recording pencil began to move. At the commencement of the following monsoon (1867) its use was therefore discontinued and the rain was carried by a copper pipe, to the basement of the tower and there discharged into a spare Rain Gauge of the same construction, but with a different scale, as the one by Newman described above. From three experiments it was found that the same quantity of water which would raise the scale of the spare gauge 1·00 division would raise that of Newman's Gauge 1·033 divisions: but this quantity corresponds to $1{\cdot}033 \times 0{\cdot}973$ inches of rain falling on a surface of $(12{\cdot}035) \times 0{\cdot}7854$ square inches, consequently as the surface exposed by Osler's Gauge is 197·87 square inches, the depth of rain which is indicated by a change of 1·00 division of the scale of its spare receiving gauge will be—

$$\frac{(12{\cdot}035)^2 \times 0{\cdot}7854}{197{\cdot}87} \times 1{\cdot}033 \times 0{\cdot}973 = 0{\cdot}5779 \text{ inch.}$$

With this coefficient a table was constructed for converting the hourly differences of the readings of the spare gauge into true inches, and the conversion was made for the previous hour, by the observer, at the time of entering in the register each hourly reading. This instrument has been regularly observed since the 7th June 1867 (and since the 6th July 1867 also at 12 P.M. on Saturdays); and on discharging, it has been always set with the scale reading 0·05.

To find how much water was absorbed in wetting the receiving funnel and conducting pipe, the spare gauge was filled on the 11th June 1867 till the scale read 2·00; the water was then drawn off and all poured into the funnel on the roof of the tower; the scale then read 1·975; consequently ·025 scale divisions or about ·015 inch was lost.

Five minutes later the experiment was repeated with a loss of less than ·006 inch. All rain records will be affected, but especially in hot climates, by evaporation from the wet surface of the receiving funnel: the one just described will show a slightly greater deficiency because the rain has to wet the conducting pipe as well as the funnel.

Description of the Tables of Meteorological Results, and of the Processes of Reduction.

1865.—*Barometric Pressure.*—In Table I. is shown, for each observation day in the year, the mean of twenty-four hourly observations reduced by means of Table II. given in the "Report of the Committee of Physics" of the Royal Society, to the temperature 32° Fahrenheit; also the mean pressure for each month and for the whole year, and the excess of each monthly mean over the annual mean: the principal features of the annual variation are also indicated at the foot of the table. No correction has been applied for capillarity.

In Table II. is shown the excess of the mean of all the observations made at a given hour in a given month over the mean of the observations made at all hours in the same month, for every hour of the day and for every month of the year; also the excess of the mean of all the observations made at a given hour in the whole year over the mean of the observations made at all hours throughout the year, for every hour of the day: the principal features of the mean diurnal variation of Barometric Pressure for the year are also indicated at the foot of the table.

Temperature of the Air, &c.—The above description of Tables I. and II. will serve also to explain Tables III. and IV., VII. and VIII., IX. and X., XII. and XIII., XIV. and XV., XVI., and XXIV. and XXV., by substituting "Temperature of Air," "Temperature of Evaporation," and the respective subjects of the several tables for "Barometric Pressure." The same description includes an explanation of the less extensive Tables V. and VI. Table XVII. shows the absolute extent of cloudiness at each hour of the day. No corrections have been applied to any of the temperature results of this year, except a constant reduction of 0·7 of the monthly and annual means of the Temperature of the Air, and of these the uncorrected values are also given at the foot of Table III.

Pressure of Vapour, Dew-point, and Relative Humidity of Air.—The pressure of vapour was calculated, by the aid of a table, by the formula—

$$f'' = f' - \cdot 01147\ (t - t') \times \frac{29\cdot 8 - f'}{30}$$

in which t and t' denote the temperatures of the Air and of the Wet Bulb Thermometer respectively, and f'' and f' represent respectively the elastic force of aqueous vapour at the temperature of the Dew-point and at temperature t'. The values of the elastic force of aqueous vapour at different temperatures were taken from the following table:—

TABLE II.:—*Showing the Elastic Force of Vapour at different temperatures calculated by Biot's formula.*

Temperature, Fahr.	Elastic Force of Vapour.	Temperature, Fahr.	Elastic Force of Vapour.	Temperature, Fahr.	Elastic Force of Vapour.	Temperature, Fahr.	Elastic Force of Vapour.	Temperature, Fahr.	Elastic Force of Vapour.
	inch.		inch.		inch.		inch.		inch.
40°	0·264	50°	0·373	60°	0·523	70°	0·726	80°	1·001
41	0·273	51	0·386	61	0·541	71	0·750	81	1·033
42	0·283	52	0·400	62	0·559	72	0·775	82	1·066
43	0·293	53	0·414	63	0·578	73	0·801	83	1·100
44	0·304	54	0·428	64	0·597	74	0·827	84	1·135
45	0·315	55	0·442	65	0·617	75	0·854	85	1·171
46	0·326	56	0·457	66	0·638	76	0·882	86	1·208
47	0·337	57	0·473	67	0·659	77	0·911	87	1·246
48	0·349	58	0·489	68	0·681	78	0·940	88	1·286
49	0·361	59	0·506	69	0·703	79	0·970	89	1·326
								90	1·367

The above table was constructed by the formula of Biot which was devised to accord with the values found experimentally by Dalton. By a simple reference to this table with the value of f'' found as above, the corresponding temperature was extracted and entered in the register as that of the Dew-point. To find the relative Humidity of the Air, the elastic force of vapour was taken from the table corresponding to the temperature of the Air, and of the Dew-point respectively, and the latter number was divided by the former.

Monthly and annual range of variation of Meteorological Elements.—Table XI. shows the extreme limits between which the oscillations of the undermentioned elements were confined in each month and in the whole year; and also the magnitude of the interval enclosed by those limits, viz.: of Height of Barometer, Temperature of Air, Temperature of Evaporation, and Temperature of Dew-point.

The remaining Tables require no explanation, beyond their titles and the headings of the several columns.

The above descriptions are for the tables of the year 1865, but apply also to those of the later years numbered, in correspondence, from I. to XX. respectively. The tables from XXI. upwards are, where necessary, explained, for each year below.

From the beginning of the year 1866 all the observations of the Dry and Wet Bulb Thermometers have been corrected for errors of graduation of the instruments, and the Pressure of Vapour, Dew-point, and relative Humidity of the Air were calculated from the corrected temperatures. And to aid in calculating these latter elements Apjohn's formula—

$$f'' = f' - \cdot01147\,(t-t') \times \frac{p-f}{30}$$

was used for the construction of tables which give the Pressure of Vapour within ·001 inch of the result of a direct application of the formula to any individual case: also instead of Biot's values of the Pressure of Vapour at different temperatures, the later determinations of Regnault were adopted. These are shown in the following table, the numbers in which have been extracted from "Boileau's Collection of Tables."

TABLE III.—Regnault's values of the Elastic Force of Vapour at different temperatures:—

Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.	Temperature.	Tension of vapour.
	inch.		inch.		inch.		inch.		inch.		inch.		inch.		inch.
35°	·204	43°	·278	51°	·374	59°	·500	67°	·662	75°	·868	83°	1·128	91°	1·455
36	·212	44	·288	52	·388	60	·518	68	·685	76	·897	84	1·165	92	1·501
37	·220	45	·299	53	·403	61	·537	69	·709	77	·927	85	1·203	93	1·548
38	·229	46	·311	54	·418	62	·556	70	·733	78	·958	86	1·242	94	1·597
39	·238	47	·323	55	·433	63	·576	71	·758	79	·990	87	1·282	95	1·647
40	·248	48	·335	56	·449	64	·596	72	·784	80	1·023	88	1·324	96	1·698
41	·257	49	·348	57	·466	65	·617	73	·811	81	1·057	89	1·366	97	1·751
42	·267	50	·361	58	·482	66	·639	74	·839	82	1·092	90	1·410	98	1·805

No corrections have been applied to the readings of any of the ground thermometers.

Fall of Rain.—The numbers given in the rain tables in this volume are all in true inches, with the exception of the fall in Osler's Gauge for 1865. No correction was applied in that case because the instrument had occupied the same position for more than twenty years, and it seemed preferable to retain comparability with the records published for previous years of that period. For both gauges in 1865 the day is from 11 P.M. to 11 P.M. and in 1867 and after, from midnight to midnight. In 1866 for Newman's Gauge the day is from 11 P.M. to 11 P.M., and for Osler's from noon to noon, this being the hour at which the registration paper was changed and the quantity of rain in the graduated vessel read.

The traces on the registration paper of Osler's Rain Gauge during the year 1865 were very imperfect, and the general untrustworthiness of the recording apparatus has already been spoken of. Under these circumstances it was customary for the First Assistant to trace over the pencil marks in ink, and to complete the curves,—according to his judgment after noticing the fall observed in Newman's Gauge,—where no pencil trace existed. As independent records, the tables of rain-fall as shown by Osler's Gauge for 1865, and probably for previous years, have not therefore much value. Neither does it seem to be practicable, on account of the obliteration or failure of the original traces, to turn the registrations to any useful account by a retabulation. The total daily rain-fall derived from the inked curves is however given as therein indicated, but the hourly registrations, being quite unreliable, have not been printed.

From the 1st to the 17th August 1865, when the instrument was under repair, the values entered in the table are taken unaltered from the registrations of Newman's Gauge. In 1866 also, as already stated, the registrations of Osler's Gauge were very unsatisfactory, and the only use that has been made of them is to find the number of times that the graduated vessel was filled and emptied. Not unfrequently it was impossible to learn from them even so much: and then the number of emptyings was found by a definite rule from the records, during the period of failure, of rain-fall in Newman's Gauge. The ratio of the total fall, during the year, in Osler's Gauge on those days when the record was complete, to the total fall on the same days in Newman's Gauge—in both cases in uncorrected inches—was 0·927 before July 5, or ·923 after July 5, according to the extent of surface exposed by Newman's Gauge. Applying these factors during the respective periods to the fall in Newman's Gauge a number was found which was either adopted simply or to which the fall adopted for Osler's Gauge was made to agree within 0·13 inch by adding an integral number of quarter inches, so as to connect the record at the beginning and end of the failure of the trace. All numbers interpolated in this manner are enclosed in brackets. The following notes will explain all the irregular numbers in Table XX. of Total Daily Fall of Rain in Osler's Gauge in 1866.

The removal of Osler's Gauge from the roof of the Astronomical Observatory to the Electrometer Tower, not being completed till the 14th June, the numbers entered for February 4 and June 3, 10, 11, 12, 13, and 14 are all obtained from the corresponding falls in Newman's Gauge; as are also those for October 8, 14, and 17, the record having been stopped after October 7.

June 16th—Trace failed;—1·00 inch added on comparing Newman's fall.

July 11th—Registration paper wetted by leakage from roof, and torn by pencil; trace lost for 14 hours for which, the fall inferred, by comparison of Newman's fall, is 2·26 inches.

July 19th—Syphon leaking from 8 P.M. to noon of the 20th: fall during 16 hours obtained from comparison with Newman = 0·54 inch.

July 20th—Syphon leaking from noon till 7 P.M: fall during 7 hours obtained from comparison with Newman = 0·54 inch.

August 11th—Trace failed:—0·75 inch added on comparing Newman's fall.

August 13th to 15th—The records from the instrument marked with these dates give the respective falls as 0·1, ·0·0, and 0·0 inch, but the doubtfulness of such great differences from the fall shown by Newman's Gauge leads to a suspicion of some error, and the values derived from Newman's falls are inserted in the table by preference.

August 18th to 29th—On the 18th the clock-pendulum fell down, its spring having broken: the numbers entered till the 29th, when the clock was repaired and started again, are derived from the fall shown by Newman's Gauge.

All the tables of rain-fall *at the different hours of the day*, include only the rain-fall on regular observation days in each year, exclusive of Sundays and holidays.

Direction and Force of Wind.

1865.—Tables XXI. to XXV. are all derived from the estimations, on week-days only, of direction and force of the wind entered hourly in the register by the observer. To form Table XXI. all the observations of direction of the wind in a given month were classed under some one or divided between two of the eight principal directions N., N.E., E., &c., by adding, for instance, to the number of hourly observations of North wind, the number of N. by E. and N. by W. winds, and half the number of N.N.E. and N.N.W. winds; to the number of hourly observations of N.E. wind, the number of N.E. by E. and N.E. by N. winds, and half the number of N.N.E. and E.N.E. winds; and so on for each of the eight points. Again all the hourly pressures observed during the month having been distributed to their respective directions, and added together for each direction by itself, there were thus obtained thirty-two sums, which were divided in the same manner as the numbers of observations, among the eight principal points. In compiling this table all observations of which the pressure was less than 0·1 lb, were wholly rejected. This table therefore, exhibits first, the *aggregate* force of the winds which blew during the whole of each month, and during the whole year, from each of the eight principal directions; secondly, the number of times that each different wind (as to direction) was observed in the whole month and in the whole year; and thirdly the average strength of the wind from each different direction, the last being got by dividing each aggregate force by the corresponding number of observations.

Table XXII. shows for each hour of the day the aggregate force of the winds which blew from each different direction during the whole year; and Table XXIII. shows also for each hour of the day, the aggregate number of times that the wind was observed to blow from each different direction in the course of the whole year. In constructing these tables the reduction of the observations from thirty-two points to sixteen was effected in the same manner as for Table XXI.

The purpose of Table XXI. is to point out the relative frequency of a particular wind (as to direction) in the different months of the year; and the relative frequency of different winds in the same month; and of Table XXIII. the relative frequency of the same wind at different hours of the day, and of different winds at the same hour. The corresponding relations of the aggregate forces are indicated by Tables XXI. and XXII.

1866.—Tables XXI.—XXV. are all obtained from hourly observations, on week days only, of a small temporary Anemometer, with four hollow hemispheres, on Robinson's principle, and from the hourly estimations of direction made by the observers. In Table XXI. the day is from midnight to midnight. For Tables XXIII. and XXIV. the velocity taken as corresponding to a given hourly observation of direction is half the movement of the wind between the preceding and following hours. To form Table XXIII. all the observations of direction of the wind in a given month were classed under some one or divided between two of the sixteen principal directions, N., NN.E., N.E., &c., by adding, for instance, to the number of hourly observations of North wind, half the number of N. by E. and N. by W. winds; to the number of hourly observations of NN.E. wind half the number of N. by E. and N.E. by N. winds; and so on for each of the sixteen points. Again, all the hourly velocities observed during the month having been distributed to their respective directions, and added together for each direction by itself, there were thus obtained thirty-two sums, which were divided in the same manner as the numbers of observations among the sixteen principal points. This table, therefore, exhibits first, the *aggregate* velocities of the winds which blew during the whole of each month, and during the whole year, from each of the sixteen principal directions; secondly, the number of times that each different wind (as to direction) was observed in the whole month and the whole year, and thirdly, the average velocity of the wind from each different direction, the last being got by dividing each of the aggregate velocities by the corresponding number of observations. The observations are reduced, for compiling Tables XXIV. and XXV. from thirty-two to sixteen points in the same manner as for Table XXIII.

On the 24th and 25th of January and again on the 5th and 6th of March 1866, a tent was erected on the top of the Electrometer Tower, which was used as an observing station by the Great Trigonometrical Survey Department. The Anemometer was partially screened by the tent and the observations of those dates should have been rejected, but were inadvertently embodied with the rest. On this account the mean velocities of the wind given for January, March, and the whole year 1866 are respectively 0·5, 0·7, and 0·1 mile too small.

1867.—Table XXII. is constructed from the registrations of Robinson's Anemometer and shows one twenty-fourth of the aggregate movement of the wind *Northward or Southward* in the whole day from midnight to midnight, and one twenty-fourth of the aggregate movement *Eastward or Westward*: these numbers expressing in the most convenient form for calculation, the resultant movement of the wind per hour on each day. Table XXIII. shows similarly the excess of the mean North or South and East or West movements of the wind at each hour of the day above the respective mean movements for the whole day, in each month from June to December.

For Tables XXIV. to XXVIII. the observations of direction of the wind from January to June are those estimated by the observers, and the values of the velocity were obtained from hourly readings of the small Robinson's Anemometer; from July to December the values used, both of direction and velocity, were those read from the registrations of the new Robinson's Anemometer: to render the records for the two half-years comparable the velocities for January to June were obtained by the method described on page xv. In Table XXIV. the day is throughout from midnight to midnight: but in forming Tables XXVI. and XXVII. for the first half of the year, half the movement of the wind between (say) 1 A.M. and 3 A.M.

was taken to represent the velocity corresponding to the direction observed at 2 A.M., and so on for every hour; thus the aggregate velocities and numbers of observations, reduced to sixteen points by the same rule as for 1866, have reference to the full hours, as indicated in the Tables: whilst, for the latter half of the year, both the directions and velocities tabulated from the Anemograms have reference to the intervals between the hours, or to periods half an hour later than those indicated in the Tables. The combination of the two sets of values is not strictly allowable, but for any purpose for which the observations of this year are required by themselves, the two tables will apply pretty closely to periods a quarter of an hour later than those indicated; and for any general inquiry concerning the winds of Bombay it will be better to consult the later years' observations, the results of which are derived wholly from the records of Robinson's Anemometer.

For the first half of the year 1867 the hourly observations are available for week-days only, whilst after the 30th June the registrations from Robinson's Anemometer were obtained on Sundays as well as week-days: the sums of velocities and numbers of observations found for the months January to June 1867 were therefore increased by one-sixth before being incorporated in Tables XXVII. and XXVIII., and in Table XXVI. the sums and numbers are shown both as actually found and as increased by one-sixth.

For 1868, 1869, and 1870, Tables XXII. to XXVI. correspond to those of the same respective numbers in 1867, except that they are *wholly* compiled from the registrations of the large Robinson's Anemometer.

II. MAGNETICAL INSTRUMENTS.

DEFLECTION AND VIBRATION APPARATUS (OLD).

Description.—The instrument that has been used for finding the intensity of the horizontal component of the earth's magnetic force, in absolute measure, from 1848 to 1867,—and for a further period of one year, for comparison with the new instrument to be presently described,—was placed in the Small Magnetic Observatory (**G**). The vibration box and the observing telescope, with divided scale, are rigidly fixed on the top of the stone pillars *e* and *f* respectively, the face of the varnished paper scale, whose divisions are 0·1 inch apart, being directed towards the box: The magnet is suspended within the box by means of a silk thread which is tied to a hook on the torsion circle and to a nut which screws on to the magnet frame: and the thread hangs in the centre of a glass tube, with brass fittings, which screws into the wooden box and carries the torsion circle cap at the top: below and with its plane vertical and parallel to the axis of the magnet, is fixed to the frame a small mirror which reflects an image of the scale into the observing telescope, the field of which is bisected by a vertical wire. As the distance of the scale from the mirror is 50·7 inches, a change of a division in the scale-reading implies an angular movement of the magnet of 3′·39, or nearly 3′·4, which has been adopted for the reduction of the torsion force observations. The vibration magnet is a solid cylinder 3·03 inches long and 0·30 inch in diameter and is marked A. 51.

The deflection box is also of wood and is similarly fitted up to the vibration box, except that the magnet—I. 11—suspended in it is 2·45 inches long and 0·30 inch in diameter. The divided paper scale is varnished and fastened to a flat frame, which is fixed to the front of the pillar, at right angles to the normal of the mirror, when the magnet rests with its axis in the meridian: its divisions, which had been made by hand, were sensibly uniform throughout, one division (a) being equal to 0·20 inch: the distance of its middle point from the front face of the mirror, *plus* two-thirds of the thickness of the mirror, was very nearly 65·76 inches, which was adopted as the value of d in the formula of reduction. Hence, if the scale reading differs from the reading of the middle division of the scale by n divisions the angular change of position (u) of the magnet I. 11 will be expressed by $\tan 2u = n\frac{a}{d} = n\frac{\cdot 20}{65\cdot 76}$; whence $\tan u = \frac{na}{2d}\left(1 - \frac{n^2 a^2}{4d^2}\right)$ with sufficient exactness where the value of u is small. A wooden rod 4 feet long passes under the deflection box, where it is secured by a vertical pin which passes through it: and on to the rod are screwed two brass grooves—one at each end—which serve as rests in which the deflecting magnet A. 51 can be placed and made to slide along. The grooves are marked at the outside edges with lines indicating feet, and tenths of feet, of distance from the central point between the two scales, and the magnet is set exactly to these lines by means of a small screw hole in the middle of its length. The scales, and magnet I. 11 suspended in the deflection box are carefully adjusted, so that the axis of the magnet A. 51, when placed on the grooves, shall lie in the same horizontal plane with the axis of the magnet I. 11. The position of the deflection rod remains in the direction perpendicular to the magnetic meridian throughout the deflection experiment.

The vibration experiment consisted in noting the time of two, three, or four hundred oscillations (indifferently) of the magnet A. 51, and this time depends—until the 13th January 1866—upon two, the initial and final, observations only: from that date till the 14th April 1866 by noting the times of the 0th, 10th, &c. 50th, passages of the middle of the scale across the wire of the telescope, and of the 100th, 110th, &c. 150th passages, six independent values of the time of 100 vibrations, viz. :—from the 0th and 100th, 10th and 110th, &c. passages were obtained: and after the latter date till the conclusion of the series of observations, by noting also the times of the 5th and 105th, 15th and 115th, &c. passages, twelve independent times of 100 vibrations were obtained. The torsion coefficient was obtained by the usual method of turning the torsion circle through 90° or 360° in both directions and observing the deflection (a) in minutes produced upon the magnet, when the torsion coefficient

$$(1 + k') = 1 + \frac{a}{90 \times 60 - a}, \text{ or } 1 + \frac{a}{360 \times 60 - a}.$$

The deflection experiment was made by placing the magnet A. 51, *first*, on the eastern brass groove at distance 1·1 foot with its marked end to eastward and observing the scale reading; *second*, on the eastern groove, at distance 1·2 foot; *third*, at the same distance with marked end of magnet to westward; *fourth*, at distance of 1·1 foot; the scale being read after each change of position: and then a set of four readings was taken with the magnet similarly placed on the western brass groove. Half the difference of the means of corresponding readings with the magnet at the same distance gave the deflection (n) at that distance. The effect of torsion was observed in the same way as in the vibration experiment. The observations were made weekly on Saturdays, and consisted until the end of 1865 of one vibration observation, and one deflection observation at each of the two distances 1·1 foot and 1·2 foot: from the beginning of 1866 the same observations were taken, and repeated immediately after in the reverse order; and the temperature was regularly recorded as part of the observation.

The readings of the Large Horizontal Force Magnetometer have always been taken at the beginning and end of a complete weekly observation; and since the 22nd August 1867 at the beginning and end of each vibration and each deflection experiment. Since the beginning of 1866 the torsion observations have been repeated every week, but before that year they were only made occasionally. All the observations have been taken by the following Observers :—

Naro Balcrishna.
Krishna Pandoorung.
Keshow Pandoorung.
Crishnajee Gunnesh.
Ramcrishna Sukaram.

The formulæ used for the reduction of the observations are—

$$X = \frac{1}{n^{\frac{1}{2}}\left\{1 - \left(\frac{a\,n}{2d}\right)^2\right\}^{\frac{1}{2}}} \cdot \frac{1}{t'\left(1 + \frac{k+k'}{2}\right)} \cdot \left\{\frac{4\pi^2 K}{R^3} \cdot \frac{d}{a}\right\}^{\frac{1}{2}} \cdot \left(1 + \frac{P}{2R^2}\right); \textit{ and}$$

$$L\,M = \frac{1}{t'^2\left(1 + k' - \frac{dX}{2X}\right) \cdot X} \cdot \frac{\pi^2 K}{2}$$

in which—

X = The mean value of the horizontal force during a set of observations.

$L\,M$ = Half the magnetic moment of the magnet A. 51 at the time and temperature of observation (and uncorrected for P).

n = The number of scale divisions through which the magnet I. 11 was deflected; with the magnet A. 51 at distance R.

a = The length of one scale division = 0·20 inch.

d = The shortest distance from the divided scale to the mirror = 65·76 inches.

t' = The time of one vibration of the magnet A. 51, corrected for rate of chronometer if exceeding 5 seconds.

k = The correction for torsion of the suspension thread of the deflected magnet I. 11.

k' = Ditto ditto vibration magnet A. 51.

π = 3·1416.

K = The moment of inertia of the magnet A. 51 with its suspension frame and mirror at the mean temperature of the series of observations = 2·254.

R = The distance between the centres of the deflecting and deflected magnets : = 1·1 foot for the larger deflection, and 1·2 foot for the smaller.

P = A constant correction, which depends on the distribution of the magnetism of the deflecting and deflected magnets.

dX = The excess of the value of X at the time of the deflection experiment over its value at the time of the vibration experiment.

The coefficient for reducing differences of scale divisions of the Large Horizontal Force Magnetometer to the scale in which X is the unit = ·0015. Increasing readings denote increasing force.

The coefficient for *correcting the reading* of the Large Horizontal Force Magnetometer for change of temperature = 0·15.

As it is desirable to know the relative, and not the absolute, values of L M, the neglect to apply the constant small correction for P is unimportant.

The value of K was found in 1845 to be 2·254, and this value has been used without alteration up to the year 1868 when the series of observations was concluded. It was calculated from the observed times of vibration (t' and t) of the magnet when suspended successively with and without two cylindrical brass bars of known and nearly equal weights (P and P') and of radius c by the formula $K = \frac{r^2(P+P')}{\frac{T'^2}{T^2} - 1}$ where r is the half distance between the points of suspension of the two brass weights, $T^2 = t^2\,(1 + k)$ and $T'^2 = t'^2\,(1 + k' + \frac{\Delta X}{X})$ the correction to t and t' being for torsion force of suspension thread, and for change of Horizontal Intensity in the interval between the two observations. The effect of change of temperature in altering the values of R and a is probably extremely minute, and has necessarily been assumed to be negligible. Its effect also upon K has been neglected, as the range of temperature being moderate, that effect is probably much within the limits of probable error of observation. Its effect in altering the strength of the magnet A. 51 between the vibration and deflection experiments which will be small, has also necessarily been neglected, as the temperature coefficient of the magnet has not been determined. Corrections to the observed time of vibration for rates of chronometer less than 5 seconds have been considered negligible; so also have the corrections for semi-arc of vibration, which has never exceeded *one degree*.

Several faults of this apparatus, and errors and uncertainties which attach to the observations made with it are described in the "Introduction to the Bombay Observations for 1864," pages xxiii. to xxvi.; and it is known that some of the values of constants adopted above are not quite accurate, but as the comparatively rude nature of the instrument scarcely permits of their determination with great nicety, it is considered that the aggregate constant error from all sources, will be most effectually found by the comparison of the results of observations made during a full year in 1867-68 with this apparatus, and with the Kew Unifilar Magnetometer.

The mean of 96 determinations of Absolute Horizontal Force with the latter instrument, at a height of 38 feet above the ground, between June 1867 and June 1868, is 8·0582; and the mean of 96 determinations with the old apparatus at a height of 6 feet, during the same period, is 8·0661. Consequently, if there were no variation of force with increase of height, the most probable values of Horizontal Force would be obtained from those given by observations with the old apparatus by dividing them by 1·0010. This result applies only to the determinations of 1865 to 1868, since the earlier observations were reduced by a different formula; and to them, only on the condition specified, which, it will be shown in Appendix IV., is opposed to the evidence on the point afforded by the observations of late years.

Remarks on the Tables of Observations of Vibration and Deflection, for the determination of Horizontal Force, taken with the Old Apparatus.

The headings of the several columns, together with the preceding descriptions of the instrument and observations, will explain fully the significance of the numbers entered under them except with regard to column 10 (for 1865—column 11 for 1866-67) which is designed to show the degree of general accuracy of the adopted value of P: the numbers in that column are the excesses of the ratios between the values of X found from deflection observations at the respective distances 1·1 foot and 1·2 foot over unity. The times of vibration, in column 2, are corrected for rates of chronometer exceeding 5 seconds. All values enclosed within brackets are interpolated. The values of X marked "*a*" are derived from imperfect sets of observations and are allowed only half the weight of the usual weekly values in calculating the mean for the month. The omissions arose from the sun being clouded at the time of observation, for the telescope glasses were so much fogged with age that it was all but impossible to make the observations with a weaker illumination of the scales than that derived from unobscured sunlight.

1865, January 6 to November 17.—No rates of chronometers having been recorded, no corrections have been applied.

December 8 to 29.—The pencil figures in the vibration observations of these dates have been altered in a manner that suggests a suspicion of the observer's honesty: and as they give extravagantly discordant results these have not been included in the annual mean.

1866.—Until April of this year one or more oil cans were regularly kept in the old electrometer room under the impression that the cans were made of zinc. On examination it was found that they were made of the ordinary tin plate, and one can placed in the nearest corner of the room to the vibration box in the room **G** was found to increase the horizontal force acting upon the vibration magnet in the ratio of 1·0004 to 1. Since that time the oil cans have always been kept in one of the distant out-houses (**R**) of the Assistants' Quarters. Also in this month the deflection bar was found to be capable of a motion bodily to and from the suspended magnet of about ·023 inch, but as much friction is sustained in the movement, no error is likely to have existed generally from this cause, since it would only be an accidental disturbance of the bar, occurring in the course of an observation, that would affect the result.

1866, July 14 to November 10.—The chronometer was rated at the beginning and end of this period but not during the interval: the rates were respectively — 1·6 seconds and + 5·7 seconds. The rule of neglecting rates less than 5 seconds has been applied to the whole period.

1866, September 20.—The deflection box was opened for the purpose of placing a scale through it to measure the distances of the marks 1·1 and 1·2 on the brass grooves: these were found to require a correction of + ·0021 foot. The opportunity was taken to eliminate the torsion from the suspension thread of the magnet I. 11, and the adjustment of the mirror was altered to throw a maximum quantity of light from the scale into the field of the telescope.

1867, June 29.—The wire of the deflection telescope having broken spontaneously a new spider line was inserted.

1867, August 24.—The deflection telescope having moved bodily, it was re-adjusted, and the fixing screws securely tightened.

1867, November 1.—Spider line of deflection telescope renewed.

Dip Circle (Old).

The instrument used, until April 1867, for the observations of Inclination is of an old pattern, by Barrow of London, without microscopes, and read off by the estimated intersection of the prolongation of the axis of the needle with the limb of the circle. The needle,—one only remaining in a moderately clean state,—is 6 inches long, and is reported frequently to have become rusted, so as to require its axle rubbing with fine emery paper: whatever therefore may have been the capabilities of the instrument in the first place, such treatment would effectually ruin it as a delicate Inclinometer. The state of the axle of the needle, both as to its figure and cleanliness, being by far the most important condition which affects the resulting observations, it will be seen that little value can be attached, under the circumstances mentioned, to the observations made with this instrument. The lifting Y's of the instrument are also faulty, in that when the lifting lever is turned, the Y's approach and recede from each other, and thus the needle fails to be invariably deposited upon the agate edges with the same points of its axle in contact with the pieces of agate. The various positions given to the circle and needle, in the course of an observation, are precisely the same as in the observations with the Kew Dip Circle described further on: so also is the operation of finding the reading of the horizontal circle which places the axis of the needle in the magnetic meridian.

In December 1865 a Barrow's Dip Circle (No. 29) with microscopes, was left in my charge by Dr. Livingstone. It had been for some time in a sunken vessel immersed in water and the brass work was much corroded, but after taking it to pieces, cleaning and oiling it, and inserting new spider lines in the microscopes, with a view to its being temporarily turned to account here, I found it in serviceable condition. The needles were, however, much rusted, and the axles quite ruined, but through the kindness of Mr. H. I. Walton a pair of them were cleaned and polished and furnished with new axles, to all appearance of perfect workmanship, in the workshop of the Indo-

European Telegraph Department at Kurrachee. I was much disappointed, therefore, on repeated trials of these needles to find them of no better character than the old needle in regular use, and the hope of improving the quality of the regular dip observations had to be abandoned until new needles were received from England. The observations were taken regularly on Tuesday and Friday in each week at about 11 A.M. by Naro Balcrishna, Krishna Pandoorung, Keshow Pandoorung, or Crishnajee Gunnesh.

Remarks on the Tables of Observations of Inclination, 1865 to 1867.

The mean result of each observation is given in Tables V. to VII.; and also the means for each month and each year. The observations, from April 7 to June 15, 1866, enclosed within brackets were taken with the Circle No. 29, and the letters *a* and *b* marked over them, are to distinguish observations made with two different 3½-inch needles:—where no letter appears one or other of these needles was used indiscriminately. The observations taken with the needles in the magnetic meridian are thirteen in number, and are the means of readings of the upper end *only* of the needle: the instrument being designed for a higher magnetic latitude than Bombay, a horizontal bar, which supports the Y's and agates obscured the view of the lower end of the needle. These observations would be affected by a constant error due to the eccentricity, in a vertical direction, of the centres of the vertical circle and of the axle of the needle, when in position for observation: but this error was determined by observing both ends of the needle,—when the needle was made, by the approach of a large bar magnet, to lie nearly horizontal,—as well before as after reversing the face of the needle: for if then the sum of the deviations of the two ends of the needle from the zenith point of the circle was less than 180°, the axle of the needle was too high, and the observed dip would be too great: such was the case and to the extent of 5′·2, requiring a correction of 2′·4, which has been applied. After the 7th April the agate edges were readjusted and the correction became + 2′·4. As is noted at the foot of the table, on the 12th and 13th April, observations were taken with this instrument in azimuths 50° and 52° respectively from the magnetic meridian, the true dip being calculated by the formula — $\cot (\text{true dip}) = \cot (\text{observed dip}) \div \cos. (\text{azimuth})$. From the 6th April 1866 the needles were magnetized with large instead of small bar magnets.

Apparatus for the Observation of Absolute Declination (Old).

Previous to December 1865 the values of the absolute declination were derived solely from the readings of the Large Declination Magnetometer: but as values so found are liable to be affected by accidental or gradual derangement of the adjustments of the Transit Instrument with which the Declinometer is read, or by inconstancy of torsion of the suspension thread (which consists of about 40 fibres of raw silk) of the Declination magnet, it was considered advisable to complete the regular absolute measures by adding the observation of absolute declination to those of dip and horizontal force. From December 1865 to June 1867 an old Horizontal Intensity apparatus with a collimator magnet together with a 7-inch theodolite by Robinson, was used for this purpose: in the latter month the Kew Unifilar Magnetometer, described further on, became available and has since been used without interruption. The nature of the observation being the same with both instruments, the description given of the latter will serve also for the former, except in the following particulars, viz :—that in the old apparatus, first, the magnet box and observing telescope are on separate supports; the box on a portable tripod, and the theodolite on a solid teakwood pillar; secondly, the theodolite could from its position be directed either upon a star, upon the scale of the collimator magnet, or upon the spire of St. John's Church. Thus it was possible to find the true meridian reading of the horizontal circle of the theodolite either from the time of passage of a Nautical Almanack star or by the known azimuth of the church spire. Until the end of May 1866 the former method was adopted; after that time, when from cloudiness it was impracticable to observe stars, the latter method was resorted to, and its use continued till the conclusion of the series of observations. The observations were taken, at a height of 26 feet above the ground, from the third story of the Electrometer Tower **F**, where the theodolite's position was 2·6 inches more eastward than the centre of the instrument pillar in the room above: from this pillar the azimuth of St. John's Church spire was found at the end of 1867 to be N. 20° 42′ 31″ E. = (200° 53′ 1″ + 179° 49′ 30″—see page lii); consequently as the church is about 1,000 yards from the Observatory, the azimuth of the church spire as seen from the theodolite pillar will be N.0° 42′ 16″ E.; and this value has been adopted in the reduction of the observations from July 1866 to June 1867. Sulphuric acid or quick lime was regularly placed in the magnet box, in small leaden vessels, on the day before that on which the observations were taken, and removed on the completion of the set of observations; the object of this procedure was to keep the air surrounding the silk suspension thread in a constant state of dryness, and so to prevent changes of torsion which otherwise accompany hygrometric changes. Torsion has always been carefully removed from the thread at the commencement of the observation, and has been again measured—except from January to May 1867—at the conclusion of the observation; and a correction has been applied, when necessary, for half the torsion found in the thread at conclusion. The observations were made with two or three exceptions, by Naro Balcrishna and Crishnajee Gunnesh.

Tables VIII. and IX. contain the series of observations referred to above; and show, besides the observed values of absolute declination, the date and time, and the mean reading, during the time of observation, of the Large Declination Magnetometer.

Kew Absolute Declinometer, and Deflection and Vibration Apparatus.

An instrument of the kind recommended by the Kew Committee for observing Absolute Declination, and for making Deflection and Vibration experiments, from which to determine the absolute Horizontal Force, was procured for this Observatory and brought into regular use in June 1867.

Situation.—The place selected for its accommodation is the uppermost room of the Electrometer Tower **F**. A strong beam of teakwood which crossed the room, under the floor, was cut away on its upper surface from contact with the floor so as to rest independently on the brick walls of the tower; and upon it was screwed, with large brass screw bolts, the basement of a cylindrical teakwood pillar, which passed through a hole in the floor (marked *y* on the plan) without touching the floor at any point. Upon the top of this pillar were fixed three radiating brass grooves, as rests for the screw feet of the circle of the instrument. From this position, which is 38 feet above the ground, can be seen horizontally not only the direct light of the sky to the southward, but the Lighthouse on the Kennery Island (13 miles distant) and a tall mill chimney at Tardeo (5 miles distant), and also a divided paper scale on a wooden block fixed to the wall of the room; and the room is well illuminated through windows on the South and East sides, and a door with window panes on the North side.

Instrument tested and Constants determined at the Kew Observatory.—The instrument was examined and tested at the Kew Observatory; and the following values of constants were determined and furnished to me by Dr. Balfour Stewart, viz.:—

Error of graduation of deflection bar at temperature 62° Faht.

at 1·0 foot = ·00000 foot.
at 1·5 foot = ·00000 foot.

For Deflecting Magnet, marked "N 23 *a*."

The Magnetic moment, m', of the magnet at temperature t_0—m being its value at temp. 35°,—

$$= m\ (1 - \cdot000{,}188\ (t_0 - 35) - \cdot000{,}000{,}112\ (t_0 - 35)^2$$

The induction coefficient $\mu = \cdot000{,}228$, $\log \mu = 6{\cdot}358562$.

Dimensions of inertia cylinder at temp. 62° Faht.

length = 3·82923 inches.
diameter = 0·39620 „

Weight of inertia cylinder = 1028·03 grains.

Description of Apparatus.—The instrument is by Elliott Brothers, and is numbered "23," and consists of the following parts, viz:—

1. A six inch horizontal circle, divided to 20′ on a conical surface in which lie also the two moveable verniers (reading to 20″) which are attached with their microscopes to the upper plate of the circle: to this plate is also fixed a rectangular copper box with a glass window at each end, and having open sides with wooden shutters: the circle rests upon three screw feet, by means of which, and of two spirit levels, the instrument may be levelled.

2. A telescope carried by a stout brass tube which is permanently screwed to the end of the copper box, and over the telescope is an arc-scale with divisions on ivory, which subtend at the centre of the circle angles of almost exactly 30″.
3. A glass suspension tube,—8 inches long, with brass fittings,—which may be screwed into the top of the copper box, and having at top a brass cap which fits on a bed fixed to the tube, and which may be turned completely round, and its position estimated to *one degree*, by divisions marked upon it : the cap carries in its centre a sliding pin,—with a hook at bottom,—which may be raised and lowered by means of a rack and pinion, and which revolves with the brass cap or torsion circle, as it is called : a silk thread is tied to the hook, and has at its lower extremity a nut for attachment to
4. A hollow cylindrical magnet, which carries under its middle point a rectangular mirror, with its plane at right angles to the axis of the magnet; and above its middle point a screw for attachment to the nut of (3). The dimensions of this magnet, which is marked " N 23 *c*" are approximately

   length = 3·00 inches,
   outer diameter = 0·30 inch,
   inner do. = 0·16 inch,
   its weight with mirror and fittings = 396 grains.

   The length of the mirror = 0·72 inch, and its breadth = 0·44 inch.
5. A brass plummet, of the same weight as, and which may be substituted in suspension for, the magnet " N 23 *c*" and fittings.
6. A loose thermometer which is laid, during the deflection observation, on the circle by the side of the copper box.
7. A brass bar—(length = 40 inches, breadth = 0·8 inch, thickness = 0·19 inch), divided into feet and twentieths from the centre outwards—which may be fixed, under the copper box, by means of tight fitting pins, to the upper plate of the circle. It is provided with a brass rider, which slides along the divided edge of the scale, serving as an index, and on which may be made to rest, and be kept in position by a pin
8. A hollow cylindrical magnet, marked " N 23 *a*," with its axis parallel to the brass bar (7), and which may be turned round, end for end, by reversing the position of the rider; and be carried over to the other end of the brass scale without disturbing its position on the rider. One end of this cylinder is closed with a plane glass, on which is cut two micrometer scales, of 60 divisions and 20 divisions respectively, at right angles to each other—the shorter crossing the end of the longer scale; each division of the scales is about ·00265 inch long : at the other, or marked end, the magnet has a lens whose principal focus is at the distance of the finely divided scales. The length of the steel cylinder is about 3·65 inches, or with the screw fittings of the scales and lens 3·92 inches, and its outer diameter is 0·40 inch. It is fixed in a light brass frame, consisting of two parallel cylindrical sockets, with a vertical socket at right angles and above for receiving a pin attached to a silk thread for suspending the magnet : the magnet is fixed in the lower socket, and the upper socket is adapted to receive the solid brass inertia cylinder, the dimensions of which are given above. The weight of the magnet and frame is approximately 655 grains.
9. A brass sight-piece, also a hollow cylinder which fits upon the **Y**'s of the rider.
10. A brass plummet of the same weight as, and which may be substituted in suspension for, the magnet "N 23 *a*" and frame.

11. A rectangular wooden box—with windows at each end, and open sides with shutters,—which may be clamped by means of a screw and nut under it, to the top of the copper box.

12. A glass suspension tube,—similarly fitted to (3), but of 12 inches length,—which may be screwed into the top of the wooden box (11).

13. A thermometer, with protected bulb, which may be screwed into the top of the wooden box (11).

The stout brass tube that carries the telescope (2),—which may be detached,—has fixed to it above a pair of **Y**'s for the support of

14. A small telescope which is directed through the windows of the wooden box (11), along a line which is three inches higher than the line along which the telescope (2) is directed through the windows of the copper box. The small telescope is provided with a revolving frame with coloured and plain glass shades,—the former for observing the sun ;—and with a prism for illuminating its wires,—of which there are two at right angles to each other,—and for testing the adjustments.

In the line of vision of the telescope (14) and beyond the vibration box (11) lies the middle of a carefully turned horizontal axis, which is supported on pivots that are provided with adjustments for level and azimuth: to this axis is attached

15. A small plane mirror,—with its plane parallel to the axis,—the normal of which will, when the axis is properly adjusted, rotate in a vertical plane containing the axis of the telescope.

16. A similar collimator magnet to (8,) marked "N 23 *b*," the brass frame of which differs in having no second horizontal socket, but two vertical sockets, one above and one below, for the reception of the suspension pin; thus allowing the magnet to be suspended with the scale either erect or inverted.

17. A brass plummet of the same weight as, and which may be substituted in suspension for, the magnet "N 23 *b*" and its frame.

Nature of Observation.—Two distinct experiments are requisite for the determination of the Absolute Intensity of the Horizontal component of the Earth's Magnetic Force; viz.—observations of vibration, and observations of deflection: the object of the first is to find the time in which the magnet (say) "N 23 *a*" suspended horizontally, and disturbed—through a fixed small angle—from its position of rest, makes a single oscillation; and to find also the torsion force of the thread by which the magnet is suspended; the object of the second is to find—when the magnet "N 23 *c*" is suspended, and the magnet "N 23 *a*" is placed with its axis in the same horizontal plane with, but at right angles to, the axis of "N 23 *c*," and directed towards the centre of "N 23 *c*," and with the centres of the two magnets a given distance apart—by what angle the axis of "N 23 *c*" deviates from the magnetic meridian.

Vibration Experiment.—The parts of the apparatus used in the vibration experiment are Nos. (1), (8), and (10) to (14). The circle (1) being placed on a suitable pillar, the wooden box (11) is clamped on, and the suspension tube (12) and thermometer (13) screwed into their places on the top of the box: the telescope (14) is placed on its **Y** supports, and the circle is turned so as to make the axis of the telescope lie approximately in the magnetic meridian and to northward of the circle; the plummet (10) is suspended and allowed to swing until—the torsion being eliminated from the silk thread—it comes to rest: the direction of a cross bar which forms part of the plummet is then estimated and the torsion circle—to which the upper end of the thread is tied—turned so as to make the position of rest of the pin attached to the bottom end of the thread the same as if the magnet "N 23 *a*" were substituted in place of the plummet: such substitution is then made, and the telescope focussed for the collimator scale of the magnet, and the observer seating himself in front of the telescope (14) with a chronometer at the foot of the pillar and a small magnet in his hand, causes the magnet "N 23 *a*" to vibrate through an angle not exceeding (in the case of Bombay) *one degree* on each side of its mean position; and he then proceeds—after laying aside the hand magnet where it will have no influence—to note the times of successive vibrations, and to fill up the following form, the manuscript figures in which form a specimen observation: —

GOVERNMENT OBSERVATORY, BOMBAY.

WEDNESDAY, December 2nd 1868.

OBSERVATIONS OF VIBRATION. No. OF OBSERVATION 50 *a*

CHRONOMETER ERROR = +2½ m DAILY RATE = +3·5 s

	Civil Time.	h. m.	Temp. of Magnet.	°	La. H. F. Magnr.		La. H. F. Thermr.	°
At commt.		12 19		87·7		24·85		83·2
At end.		12 31		88·0		24·80		83·2
Means.		12 25		87·8		24·82		83·2
Means Corrected.		12 22½						

SCALE MOVING APPARENTLY

To the Right.						To the Left.				
No. of Vibn.	Time of passing Wire.			Time of 180 Vibns.		No. of Vibn.	Time of passing Wire.		Time of 180 Vibns.	
	h.	m.	s.	m.	s.		m.	s.	m.	s.
0	12	19	4·0			9	19	28·0		
180	,,	27	5·0	8	1·0	189	27	29·1	8	1·1
18	,,	19	52·0			27	20	16·0		
198	,,	27	53·1	8	1·1	207	28	17·2	8	1·2
36	,,	20	40·1			45	21	4·2		
216	,,	28	41·2	8	1·1	225	29	5·2	8	1·0
54	,,	21	28·2			63	21	52·2		
234	,,	29	29·3	8	1·1	243	29	53·3	8	1·1
72	,,	22	16·3			81	22	40·3		
252	,,	30	17·4	8	1·1	261	30	41·5	8	1·2
90	,,	23	4·4			99	23	28·4		
270	,,	31	5·5	8	1·1	279	31	29·6	8	1·2
90 − 0	,,	4	0·4		5	99 − 9	4	0·4		8
Time for 180th	,,	27	4·8	8	1·083	Time for 189th	27	28·8	8	1·133
			Mean =	8	1·108	Time of 90 vibns.	s = 240·554			
Mean Time of 180 Vibns. =					s 481·108	Time of 1 vibn.	= T_0 =			s 2·6728

TORSION FORCE.

Torsion.	Scale divn.	Means and Diffs.	
0°	0·00	− 0·05	0·90
+ 90	+ 0·85	+ 0·05	0·95
0	− 0·10	For 90°...0·92	
− 90	− 0·90	+ 0·15	2·80
0	+ 0·20	+ 0·15	3·05
+ 360	+ 2·95	For 360° 2·92	
0	+ 0·10	For 90°...0·73	
− 360	− 2·90	Adopt. Effect of 90° Torsion.	
0	+ 0·20	0·82 Sc. div.	

Vertical Scale Reading. } = 16·5

Observer.

C. G. T.

It should be mentioned that the instrument is so placed that the light of the sky illumines the field of the telescope after passing through the hollow interior of the collimator magnet, and that an image of the scale is seen which moves to and fro when the magnet oscillates: the collimator scale has a long line in the middle projecting both above and below the scale, and the 0th, 9th, 18th, &c., passages of this line across the fixed vertical wire of the telescope determine the times of commencement of the 1st, 10th, 19th, &c., vibrations: also, the limitation of the oscillation to within 25 divisions of the scale on either side of the long line limits the semi-arc of vibration within *one degree*, since each division subtends an angle of 2′·33 with the centre of the collimator lens.

After the time of the 99th passage has been noted, the observer stops, and calculates the times of the 180th and 189th, at the former of which passages he resumes the observations and continues till the occurrence of the 279th passage. By then taking the differences between the 180th and 0th, the 189th and 9th &c. passages, twelve independent values are obtained of the time of 180 vibrations, and the mean of these divided by 180 is adopted as the observed time (T_0) of one vibration.

The observer then brings the magnet to rest with the small hand magnet, and reads the collimator scale with the telescope, entering the reading in the "Torsion Force" form opposite 0°; the torsion circle is now turned to increase its reading by 90° and another reading of the scale is made and entered opposite +90°; similarly for successive amounts of torsion of 0°, − 90°, 0°, + 360°, 0°, − 360°, and 0°. From the first five and last five of these readings, the change of scale-reading produced by introducing 90° of torsion into the suspension thread is found independently, and generally the mean of the two values is adopted.

The reading of the vertical scale of the collimator cut by the horizontal wire of the telescope is made to call attention to any important change of inclination of the magnet, and to remove any doubt, in the case of irregular observations, as to the possible effect of such change on the horizontal magnetic moment, or on the moment of inertia of the magnet. It was found, before fixing the magnet "N 23 *a*" in its frame, that the line joining the centre of the lens with the intersection of the divisions + 9·5 on the horizontal scale, and + 16·7 on the vertical scale, was parallel to the magnetic axis of the magnet; this was found by repeated inversions and readings of each scale when made to appear horizontal. When fixed the reading of the vertical scale was about + 15 which, as the tightening of the fixing screw moved the magnet in its socket, seemed to be as near to + 16·7 as it was practicable to bring it: and the amount of error herein implied will have no appreciable effect on the observations. The readings of the thermometer (13), and of the Large Horizontal Force Magnetometer (differential instrument) and its thermometer are made at the commencement and end of the observation. The error of the chronometer is determined by comparison, three times a week; and from these errors, entered in the magnetic register, the observer deduces the rate and enters it in the form.

Deflection Experiment.—The parts of the apparatus used in the deflection experiment are Nos. (1) to (9). The circle (1) as before, being placed on the pillar, the telescope (2) with scale is screwed on to the stout tube, and the suspension tube (3) into the top of the copper box; the circle is then turned so as to place the telescope to southward of it. The torsion of the silk thread having been eliminated by means of the plummet (5)—as at the commencement of the vibration experiment—the magnet "N 23 *c*" (4) is suspended with the face of the mirror directed towards the telescope or southward. The thermometer (6) is laid on the circle, the brass bar (7) is pinned in its place with its divided face southward, and the rider is placed upon it, at the eastern side of the circle, and set to a given reading: at Bombay the readings successively used are 0·8 foot and 1·0 foot: the sight-tube (9) is now placed on the rider, and the elevation of the magnet regulated by means of the rack and pinion of (3) so as to place the centre of the magnet in the horizontal line of sight of the tube, and the copper box is closed. The magnet "N 23 *a*" (8) is then placed on the rider, instead of the sight-tube, with its marked end pointing eastward; and the circle is turned until the axes of the two magnets are at right angles to each other: this is known to be the case, or near enough, when the vertical wire of the telescope—which is focussed for the scale—cuts the middle division of the scale as seen by reflexion from the mirror of the magnet "N 23 *c*": the position is first approximately found and the circle clamped, and the exact adjustment then made by means of the tangent screw of the circle. The next operations are the reading of the thermometer and chronometer, and of the verniers of the circle, and the entry of the readings in the following form:—

Specimen Observation.

GOVERNMENT OBSERVATORY, BOMBAY.

Wednesday, December 2nd 1868

OBSERVATIONS OF DEFLECTION. No. of Observation, 50 b

At commencement.	La. H. F. Magnr.	24·57	La. H. F. Thermr.	83·5	Observer.
At end.		24·50		84·0	
Means.		24·53		83·7	C. G. T.
Means corrected.					

Civil Time by Chronometer.	Deflecting Magnet.			Scale Reading.	Readings of Verniers.	Mean of Verniers.	Means and Differences.
	Distance E. or W.	N. End.	Temp.				
h. m.	Feet.		°	Divn.	° ′ ″	° ′ ″	° ′ ″
13 0	0·8 E.	E.	88·1	200	216 57 0 57 10	216 57 5	217 12 40
13 6	1·0 E.	E.	88·2	200	207 10 30 10 40	207 10 35	177 1 35 40 11 5
13 11	1·0 E.	W.	88·2	200	186 55 40 55 50	186 55 45	
13 17	0·8 E.	W.	88·2	200	176 59 0 59 10	176 59 5	
13 22	0·8 W.	W.	88·3	200	177 4 0 4 10	177 4 5	207 17 10
13 27	1·0 W.	W.	88·3	200	186 58 0 58 10	186 58 5	186 56 55 20 20 15
13 31	1·0 W.	E.	88·3	200	207 23 40 23 50	207 23 45	
13 36	0·8 W.	E.	88·4	200	217 28 10 28 20	217 28 15	
150	Sums.		20				
13 19	Means.		88·2				
13 16½	Time Corrected.						

		°	′	″
Observed Angles of Deflection…	$r_0 = 0·8$; u =	20	5	32
	$r_0 = 1·0$; u' =	10	10	7

The rider with the magnet is now made to slide along to the distance 1·0 foot, and the circle is turned again and corresponding readings of the thermometer, chronometer, and verniers are entered: next the rider and magnet are together reversed in azimuth, then made to slide back to the first distance 0·8 foot; then carried over, without reversal, to 0·8 foot on the other (western) end of the bar (7); then slidden to 1·0 foot; then reversed in azimuth; and finally slidden back to 0·8; the readings of the thermoneter, chronometer and verniers being made after each setting of the rider. To ensure that the exact setting of the circle at each removal of the rider and magnet is not inadvertently omitted, the middle reading (200) of the ivory scale is entered in the form each time immediately after the setting is made. If the successive mean readings of the verniers are called *a*, *b*, *c*, *d*, *e*, *f*, *g*, and *h*; and *u* is the mean angle of deflection when the deflecting magnet is placed on the brass bar at 0·8 foot, and *u′* when at 1·0 foot, then

$$u = \tfrac{1}{2}\left\{\frac{a+h}{2} - \frac{d+e}{2}\right\}; \text{ and } u' = \tfrac{1}{2}\left\{\frac{b+g}{2} - \frac{c+f}{2}\right\}$$

which reductions are made on the form. With these explanations, and those given of the vibration form, the deflection form, with the obvious calculations of averages indicated on it, will be intelligible without further remark. In the second deflection experiment the rider and magnet are placed on the western end of the brass bar for the first four, and on the eastern end for the last four observations, and the relative positions, in azimuth, of the rider and magnet are reversed.

The object of having a copper box in which to suspend the small magnet in the deflection experiment is that if the magnet begins to oscillate it will quickly be brought to rest again by the reaction of electrical currents generated in the box by the motion of the magnet : whilst in the vibration experiment, where it is desired that the extent of oscillation should be as constant as possible throughout the observation, a wooden box is used to avoid the action described.

Order and day and times of Observations.—A set of weekly observations consists of—

a—An observation of vibration, and one of torsion force.
b— Do. deflection.
c— Do. do.
and *d*— Do. vibration, and one of torsion force.

And the weekly sets are numbered consecutively from the beginning to the end of the year. The first vibration experiment usually commences about 11-30 A.M. and the last concludes by about 3·30 P.M. After the conclusion of the first deflection experiment, which is made as soon after the vibration experiment as the apparatus can be re-arranged, an interval of from 30 to 50 minutes is allowed to elapse before commencing the second. With rare exceptions the observations are taken on the Wednesday of each week.

Reduction and examination of Observations.—At the conclusion of each weekly set of vibration and deflection experiments, the observer at once makes the reductions, indicated on the forms of the observation books, and checks throughout the similar reductions made by the other observer for the previous week. The observations are scrutinized by the Superintendent, or latterly by the First Assistant, immediately after they are completed; and if any irregularity is found in the course of an observation, it is at once brought to his notice; but generally the system has worked very smoothly, the observations being very consistent one with another, subject, of course, to the changes in the power of the deflector magnet and in the horizontal magnetic force.

Final Reduction and Formulæ.—The reduction of the observations is deferred until a full year's results are accumulated—thus greatly economizing time in the computing operations—and the various elements observed are then copied into the following computation form, on which are shown also the formulæ of reduction :—

Specimen Computation.

GOVERNMENT OBSERVATORY, BOMBAY.

REDUCTION OF OBSERVATIONS made with the Kew Unifilar (Elliott Bros. No. 23).

No. of Observation 31 — August 3rd 1870.

At	H. F. Magnr.	Thermr.	Civil Time. Mean.	Mean Temp.	$-\frac{H}{F}$	−·00035
Defln. (D)	25·02	° 83·1	h. m. 13 5	° 85·1	$-\mu\div\left(\frac{m}{X}\right)_o$	−·00266
Vibn. (V)	25·11	82·9	12 5	85·2		−·00301
Means.	25·06	83·0	12 35	85·1	$+\frac{2s}{86{,}400}$	−·00005
D—V	−0·09	+0·2	Rate of Chronometer.	Observer. J. G. C.		−·00306
Corrn.	+0·03		s − 2·2		$+\left(q+2\epsilon'\right)\left(t_v-t\right)$	+·01042
Corrd.	−0·06		90° Torsion Sc. div.			
$\frac{dX}{X}$	−·00009		0·81		$1+a$	1·00736

$$\left(mX\right)=mX\left(1-\frac{dX}{2X}\right)=A\frac{1+a}{T_o^2}$$

$$a=\left(q+2\epsilon'\right)\left(t_v-t\right)-\frac{H}{F}-\mu\div\left(\frac{m}{X}\right)_o+\frac{2s}{86400}$$

$$\left(\frac{m}{X}\right)=\frac{m}{X}\left(1-\frac{dX}{2X}\right)=B\left(1+b\right)\text{Sin u}$$

$$b=\left(q+3\epsilon\right)\left(t_d-t\right)$$

$$X^2=\left(mX\right)\div\left(\frac{m}{X}\right)=A\frac{1+a}{T_o^2}\cdot\frac{1}{B\left(1+b\right)\text{Sin u}}$$

$$m^2\left(1-\frac{dX}{X}\right)=\left(mX\right)\cdot\left(\frac{m}{X}\right)=A\frac{1+a}{T_o^2}\cdot B\left(1+b\right)\text{Sin u}$$

$$m^2=\left(A\frac{1+a}{T_o^2}\right)\left\{B\left(1+b\right)\text{Sin u}\right\}\left(1+\frac{dX}{X}\right)$$

$$A=\pi^2K'\left\{1-\left(q+2\epsilon'\right)\tau_v+[a]^2\right\};\qquad B=\frac{r_1^3\left\{1-\left(q+3\epsilon\right)\tau_d+[b]^2\right\}}{2\left\{1-\frac{2\mu}{r_o^3}+\frac{P}{r_o^2}\right\}}$$

				$r_o = 0·8$	$r_o = 1·0$
$T_o =$	s 2·7181				
T_o log =	0·43427		u =	19° 20′ 44″	9° 48′ 15″
T_o^2 log =	0·86854	Sin u	log =	9·52018	9·23117
$1+a$ log =	0·00378	$1+b$	log =	0·00484	0·00484
$\frac{1+a}{T_o^2}$ log =	9·73464	B	log =	9·41246	9·70144
A log =	1·61751	B (1 + b) Sin u	log =	8·93748	8·93745
$A\frac{1+a}{T_o^2}$ log =	0·75215	$A\frac{1+a}{T_o^2}$	log =	0·75215	0·75215
(Mean) B (1 + b) Sin u log =	8·93746	X^2	log =	1·81467	1·81470
$1+\frac{dX}{X}$ log =	−0·00004	X	log =	0·90733	0·90735
m^2 log =	9·68957	X	=	8·0785	8·0789
m log =	9·84478	(Mean) X	=	8·0787	
m =	·69949				

In the formulæ

m = Magnetic moment of the deflecting or vibrating magnet "N 23 a" at temperature 35° Faht.

$m \{ 1 - q\,(t_0 - 35) - q'\,(t_0 - 35)^2 \}$ = do. at temperature t_0; where $q = \cdot000188$ and $q' = \cdot000{,}000{,}112$.

X = Horizontal component of the earth's magnetic force, or the mean of its values during the vibration experiment and during the deflection experiment.*

dX = The excess of the mean value of the horizontal force during the deflection experiment, above its mean value during the vibration experiment.

T_0 = Observed time of one vibration of the magnet "N 23 a."

ϵ' = The linear expansion coefficient of steel, the adopted value of which is ·000,007.

t_v = Mean reading of thermometer in vibration experiment.

t_d = Do. do. in deflection do.

t = 35° Fahrenheit.

$\frac{H}{F}$ = Ratio of the force of torsion of the suspending thread of the vibration magnet to the magnetic directive force: [This is obtained from the formula $\frac{H}{F} = \frac{2'\cdot33 \times n}{5400 - n \times 2'\cdot33}$; where n = the number of divisions of the collimator scale through which the magnet is deflected by a twist of 90° in the thread.]

μ = The increase in the magnetic moment of the magnet "N 23 a" produced by the inducing action of a magnetic force equal to unity of the English system of absolute measurement.

s = Daily rate of chronometer, + when gaining, – when losing.

r_0 = The distance, read on the brass deflection bar, between the centres of the deflecting and suspended magnets, in the observation of deflection.

$r_,$ = The above distance (r_0) corrected for error of graduation, which is zero, and reduced to temperature 35°; $\left[r_, = r_0 \{ 1 + \cdot00001\,(35 - 62) \}\right]$.

u = Observed angle of deflection when $r_0 = 0\cdot8$ foot.

u' = Ditto when $r_0 = 1\cdot0$ foot.

ϵ = The linear expansion coefficient of brass, the adopted value of which is ·00001.

π = Ratio of the circumference to the diameter of the circle, the adopted value of which is 3·1416.

K' = Moment of inertia of the magnet "N 23 a," including its suspending frame and other appendages, at temperature 35°.

τ_v = The error of the vibration thermometer at the mean temperature of the series of observations.

τ_d = Do. deflection thermometer at the mean temperature of the series of observations.

$[a]$ = The mean value of $a \left[= (q + 2\,\epsilon')\,(t_v - 35) - \frac{H}{F} - \mu \div \left(\frac{m}{X}\right)_0 + \frac{2\,s}{86400}\right]$ for the series of observations, or, nearly enough, the mean of the greatest and least values.

$[b]$ = The value of $b\ [= (q + 3\,\epsilon)\,(t_d - 35)]$, when for t_d is put the mean temperature of the series of observations.

P = A constant correction which depends on the distribution of magnetism in the deflecting and deflected magnets.

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* The English unit of magnetic force is that which acting upon unity of mass (one grain) during unity of time (one second) would cause that mass to move with the unit velocity (one foot per second) at the end of the second.

$\left(\frac{m}{X}\right)_0 = \frac{r_1^3 \left\{1 + 3\epsilon\left([t_d] - 35\right)\right\}}{2\,(1 + P - 2\,\mu)}$. Sin u, when for $[t_d]$ is put the mean temperature of the series of observations, and $r_0 = 1{\cdot}0$ foot.

q, as a factor of τ_v and τ_d, is written shortly for the value of $\left\{q + 2\,q'\,(t_0 - 35)\right\}$ when for t_0 is put the mean temperature of the series of observations.

$q\,(t_v - t)$ must be understood to include $\left\{q\,(t_v - 35) + q'\,(t_v - 35)^2\right\}$ and similarly for $q\,(t_d - t)$.

Derivation of formulæ of reduction.—The formulæ are obtained from the fundamental equations of Gauss in the following manner :—

For the vibration observation

$$\left[m\left\{1 - q\left(t_v - \tau_v - t\right) - q'\left(t_v - \tau_v - t\right)^2\right\}\left\{1 + \mu \div \left(\frac{m}{X}\right)_0\right\} \cdot X\left(1 - \frac{dX}{2X}\right)\right]\left(1 + \frac{H}{F}\right) = \frac{\pi^2 K'\left\{1 + 2\epsilon'\left(t_v - \tau_v - t\right)\right\}}{T_0^2\left(1 - \frac{2s}{86400}\right)\left(1 - \frac{a\,a'}{8}\right)}$$

a and a' are the semi-arcs of vibration at the beginning and end of the observation, expressed in parts of radius.

Or $\Big[m\Big\{$ (correction for temperature) · (correction for induction) $\Big\}$

$\Big\{$ X (correction to time of vibration experiment) $\Big\}\Big]$ (correction for torsion force)

$$= \frac{\pi^2 \left\{ K' \text{ (correction for expansion)} \right\}}{T_0^2 \text{ (correction for rate of chronometer)} \,.\, \text{(correction for arc of vibration)}}\,.$$

By transposition this becomes—

$$(mX) = mX\left(1 - \frac{dX}{2X}\right) = \frac{\pi^2 K'\left\{1 + 2\epsilon'\left(t_v - \tau_v - t\right)\right\}}{T_0^2\left\{1 - q\left(t_v - \tau_v - t\right) - q'\left(t_v - \tau_v - t\right)^2 + \frac{H}{F} + \mu \div \left(\frac{m}{X}\right)_0 - \frac{2s}{86400} - \frac{a\,a'}{8}\right\}}$$

$$= \frac{\pi^2 K'}{T_0^2\left\{1 - \left(q + 2\epsilon'\right)\left(t_v - \tau_v - t\right) - q'\left(t_v - \tau_v - t\right)^2 + \frac{H}{F} + \mu \div \left(\frac{m}{X}\right)_0 - \frac{2s}{86400} - \frac{a\,a'}{8}\right\}}$$

$$= \frac{\pi^2 K'\left\{1 - (q + 2\epsilon')\,\tau_v\right\}}{T_0^2\left[1 - \left\{(q + 2\epsilon')\left(t_v - t\right) + q'\left(t_v - t\right)^2 - \frac{H}{F} - \mu \div \left(\frac{m}{X}\right)_0 + \frac{2s}{86400} + \frac{a\,a'}{8}\right\}\right]}$$

since $2\,q'\,(t_v - t)\,\tau_v$ is negligible

and making $a = (q + 2\epsilon')\left(t_v - t\right) + q'\left(t_v - t\right)^2 - \frac{H}{F} - \mu \div \left(\frac{m}{X}\right)_0 + \frac{2s}{86400} + \frac{a\,a'}{8}$

$$= \frac{\pi^2 K'\left\{1 - (q + 2\,\epsilon')\,\tau_v\right\}}{T_0^2\,(1 - a)}$$

$$= \frac{\pi^2 K'\left\{1 - (q + 2\epsilon')\,\tau_v\right\}(1 + a + a^2)}{T_0^2}$$

This transformation is made for convenience in computing; the taking out, entering, and addition or subtraction of the logarithm of a number slightly exceeding unity being less troublesome, when oft-repeated, than if the number be slightly in defect of unity.

$$= \pi^2 K'\left\{1 - (q + 2\epsilon')\,\tau_v + a^2\right\} . \frac{1 + a}{T_0^2}$$

in which a^2 will be sensibly constant through a long period of observation : call it then $[a]^2$, and make

$$A = \pi^2 K'\left\{1 - (q + 2\epsilon')\,\tau_v + [a]^2\right\} = \text{a constant}$$

$$(mX) = mX\left(1 - \frac{dX}{2X}\right) = A\,\frac{1 + a}{T_0^2} \qquad (1)$$

And for the deflection observation

$$\frac{\dfrac{2m\left\{1-q\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)-q'\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)^2\right\}\cdot\left\{1-\dfrac{2\mu}{r_\circ^3}\right\}}{r_{,}^3\left\{1+3\epsilon\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)\right\}}\cdot\left\{1+\dfrac{P}{r_\circ^2}\right\}}{\mathrm{X}\left(1+\dfrac{d\mathrm{X}}{2\mathrm{X}}\right)}=\operatorname{Sin}u.$$

or

$$\frac{\dfrac{2m\text{ (correction for temperature) (correction for induction)}}{\left\{r_{,}^3\text{ (correction for temperature)}\right\}}\text{ (correction for sensible dimensions of magnets)}}{\mathrm{X}\text{ (correction to time of deflection experiment.)}}=\operatorname{Sin}u.$$

By transposition this becomes

$$\frac{m}{\mathrm{X}}\cdot\frac{1+\dfrac{\mathrm{P}}{r_\circ^2}}{1+\dfrac{d\mathrm{X}}{2\mathrm{X}}}=\frac{\frac{1}{2}r_{,}^3\left\{1+3\epsilon\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)\right\}\operatorname{Sin}u}{\left\{1-q\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)-q'\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)^2\right\}\left(1-\dfrac{2\mu}{r_\circ^3}\right)}$$

$$=\frac{\frac{1}{2}r_{,}^3\operatorname{Sin}u}{\left\{1-(q+3\epsilon)\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)-q'\left(t_{\mathrm{d}}-\tau_{\mathrm{d}}-t\right)^2\right\}\left(1-\dfrac{2\mu}{r_\circ^3}\right)}$$

$$=\frac{\frac{1}{2}r_{,}^3\left\{1-(q+3\epsilon)\tau_{\mathrm{d}}\right\}\operatorname{Sin}u}{\left\{1-(q+3\epsilon)\left(t_{\mathrm{d}}-t\right)-q'\left(t_{\mathrm{d}}-\mathrm{t}\right)^2\right\}\left(1-\dfrac{2\mu}{r_\circ^3}\right)}$$

And making $b=(q+3\epsilon)\,(t_{\mathrm{d}}-t)+q'\,(t_{\mathrm{d}}-t)^2$

$$=\frac{\frac{1}{2}r_{,}^3\left\{1-(q+3\epsilon)\tau_{\mathrm{d}}\right\}\operatorname{Sin}u}{(1-b)\left(1-\dfrac{2\mu}{r_\circ^3}\right)}$$

$$=\frac{\frac{1}{2}r_{,}^3\left\{1-(q+3\epsilon)\tau_{\mathrm{d}}\right\}(1+b+b^2)\,.\operatorname{Sin}u}{1-\dfrac{2\mu}{r_\circ^3}}$$

$$=\frac{\frac{1}{2}r_{,}^3\left\{1-(q+3\epsilon)\tau_{\mathrm{d}}+b^2\right\}}{1-\dfrac{2\mu}{r_\circ^3}}\,.\,(1+b)\,.\operatorname{Sin}u.$$

$$\left(\frac{m}{\mathrm{X}}\right)=\frac{m}{\mathrm{X}}\left(1-\frac{d\mathrm{X}}{2\mathrm{X}}\right)=\frac{\frac{1}{2}r_{,}^3\left\{1-(q+3\epsilon)\tau_{\mathrm{d}}+b^2\right\}}{1-\dfrac{2\mu}{r_\circ^3}+\dfrac{P}{r_\circ^2}}\cdot(1+b)\operatorname{Sin}u$$

in which b^2 will be sensibly constant through a long period of observation: call it then $[b]^2$ and make

$$B=\frac{r_{,}^3\left\{1-(q+3\epsilon)\,t_{\mathrm{d}}+[b]^2\right\}}{2\left\{1-\dfrac{2\mu}{r_\circ^3}+\dfrac{P}{r_\circ^2}\right\}}$$

$$\left(\frac{m}{\mathrm{X}}\right)=\frac{m}{\mathrm{X}}\left(1-\frac{d\mathrm{X}}{\mathrm{X}}\right)=B\cdot(1+b)\operatorname{Sin}u\qquad(2)$$

Dividing now equation (1) by equation (2)

$$\mathrm{X}^2=\left(A\,\frac{1+a}{T_\circ^2}\right)\frac{1}{B\,.\,(1+b)\operatorname{Sin}u}$$

$$\mathrm{X}=\left\{\left(A\,\frac{1+a}{T_\circ^2}\right)\cdot\frac{1}{B\,(1+b)\operatorname{Sin}u}\right\}^{\frac{1}{2}}$$

and multiplying the equations together

$$(m\mathrm{X})\,.\left(\frac{m}{\mathrm{X}}\right)=m^2\left(1-\frac{d\mathrm{X}}{\mathrm{X}}\right)=\left\{A\,\frac{1+a}{T_\circ^2}\right\}\cdot\left\{B\,(1+b)\operatorname{Sin}u\right\}$$

$$\text{and }m^2=\left\{A\cdot\frac{1+a}{T_\circ^2}\right\}\left\{B\,(1+b)\operatorname{Sin}u\right\}\left(1+\frac{d\mathrm{X}}{\mathrm{X}}\right)$$

$$m=\left[\left\{A\,\frac{1+a}{\mathrm{T}_\circ^2}\right\}\cdot\left\{B\,(1+b)\operatorname{Sin}u\right\}\left(1+\frac{d\mathrm{X}}{\mathrm{X}}\right)\right]^{\frac{1}{2}}$$

Into the above computation form a and a' do not enter, because the semi-arc of vibration at the commencement of the observation never exceeds *one degree*, the correction for which would be only ·00001 of the whole value of X, which is negligible.

In all other cases the corrections are applied down to this limit (·00001), which is about sixty times smaller than the probable error of a single determination of X. The lines in the form marked "Corrn." "Corrd." and "$\frac{dX}{X}$" are for the correction of the difference of reading of the Large Horizontal Force Magnetometer for difference of reading of its thermometer, for the corrected difference, and for that corrected difference converted into a fraction of the whole force. The coefficient used for reducing the difference of temperature to its equivalent in scale readings of the Large Horizontal Force Magnetometer is 0·15, that for converting the corrected difference of readings into force is ·0015.

Tables for facilitating computations.—Tables are formed for facilitating the calculations, as follows;—

I. Values of $\frac{H}{F}$ corresponding to different deflections,—expressed in divisions (n) of the collimator scale of the magnet "N 23 *a*"—caused by a twist of 90° introduced into the silk suspension thread.

II. Values of $\mu \div \left(\frac{m}{X}\right)_0$ corresponding to different observed values of the angle u.

III. Values of $\frac{2s}{86400}$ for different values of s.

IV. Values of $\left\{ (q + 2\epsilon') (t_v - 35) + q' (t_v - 35)^2 \right\}$ for different values of t_v.

V. Values of log. $\left\{ 1 + (q + 3\epsilon') (t_d - 35) + q' (t_d - 35)^2 \right\}$ for different values of t_d.

Determination of Constants.—The values of the constants given on page xxxiii, supplied by the Kew Observatory have necessarily been adopted as they there stand, as no means of verification of them exist in this Observatory. But with respect to the value of K′, which was also determined at Kew—but from a small number of observations—it was practicable to redetermine the value independently, and this has accordingly been done.

Value of K′.—Before the commencement and after the conclusion of the regular weekly observations, a vibration experiment was made with the magnet "N 23 *a*," after placing the inertia cylinder in its socket and balancing so that the same division of the vertical scale (with sufficient nearness) was cut by the horizontal wire of the telescope as when the inertia cylinder was away. A separate suspension cap with stronger thread was kept specially for this purpose. From the 8th July 1868 to the 17th February 1869 these observations were repeated (with two or three exceptions) weekly, but since the latter date they have been repeated only once a month. The value of K′ adopted was derived from thirteen independent determinations made from observations between July 16th and October 14th 1868. The values of $\frac{1+a}{T_0^2}$ were calculated for these and the observations without inertia cylinder exactly as for the regular vibration experiment, except that the correction for rate of chronometer was applied separately. If we call the values of $\frac{T_0^2}{1+a}$, T_i^2 and T^2 according as the inertia cylinder is or is not suspended, and if t_v' and t_v be the corresponding temperatures, and K_m and K_c the moments of inertia, at temperature 80°, of the magnet and inertia cylinder respectively, then will

$$K_m = K_c \frac{T^2\left\{1+2(\epsilon-\epsilon')(t'_v-80)\right\}}{T_,^2\left(1+\frac{dX}{X}\right)\left\{1+2\epsilon'\left(t_v-t'_v\right)\right\}-T^2} = K_c \frac{T^2\left\{1+{\cdot}000006\left(t_v-80\right)\right\}}{T_,^2\left(1+\frac{dX}{X}\right)\cdot\left\{1+{\cdot}000014\left(t_v-t'_v\right)\right\}-T^2}$$

where $K_c = 1028{\cdot}03\left\{\frac{\left(\frac{3{\cdot}82923}{12}\right)^2}{12}+\frac{\left(\frac{0{\cdot}39620}{12}\right)^2}{16}\right\}(1{\cdot}00036)$,

the last coefficient being for reduction from temperature 62° to temperature 80°: $\frac{dX}{X}$ is the excess of the horizontal force at the time of the vibration with the inertia cylinder above its value at the time of the vibration without the inertia cylinder, and is obtained from the corresponding readings of the Large Horizontal Force Magnetometer.

The following table shows the results of all the earlier observations made for this purpose, and the deduced values of K_m:—

1868.	Without Inertia Cylinder.					With Inertia Cylinder.					$\mu \div \left(\frac{m}{X}\right)_0$	$\frac{dX}{X}$	Deduced value of K_m.
	Magnet "N 23 *a*."			Corresponding mean reading of L. H. F. Magnetometer.		Magnet "N 23 *a*."			Corresponding mean reading of L. H. F. Magnetometer.				
Date.	Time of one Vibration.	Effect of 90° Torsion.	Temperature.	Scale Reading	Thermometer.	Time of one Vibration.	Effect of 90° Torsion.	Temperature.	Scale Reading	Thermometer.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
	s.	Sc. div.	°		°	s.	Sc. div.	°		°			
July 8	2·6467	0·76	90·2	24·21	86·1	4·6602	2·23	90·0	24·35	86·0	·00254	+ ·00003	$\boxed{4{\cdot}1826}$
,, ,,	2·6475	0·78	91·3	23·68	86·4	4·6631	2·27	91·5	23·57	86·4	·00254		
,, 15	2·6492	0·64	83·2	22·78	81·6	4·6606	2·06	83·4	23·58	81·3	·00253	+ ·00114	$\boxed{4{\cdot}1884}$
,, 16	2·6480	0·56	81·2	24·16	80·5	4·6596	1·96	80·4	24·38	80·3	·00253	+ ·00010	4·2036
,, ,,	2·6490	0·57	81·4	23·69	80·9	4·6593	2·08	81·5	23·62	81·0	·00253		
,, 22	2·6496	0·64	86·4	24·50	83·8	4·6585	2·27	87·2	24·63	83·9	·00254	− ·00010	4·2045
,, ,,	2·6497	0·61	86·7	23·87	84·0	4·6580	2·04	86·4	23·60	83·9	·00254		
,, 29	2·6493	0·61	81·8	24·24	81·6	4·6626	1·94	82·9	24·23	81·5	·00254	− ·00006	4·1968
,, ,,	2·6495	0·66	81·8	23·79	81·1	4·6638	1·97	82·0	23·71	81·2	·00254		
Aug. 5	2·6535	0·61	87·3	23·68	83·7	4·6650	2·10	87·1	23·83	83·6	·00253	− ·00003	4·2046
,, ,,	2·6535	0·63	87·7	23·52	84·2	4·6645	2·09	88·0	23·34	84·2	·00253		
,, 12	2·6531	0·62	82·7	24·17	81·5	4·6661	2·06	82·6	24·09	81·3	·00253	− ·00012	4·2055
,, ,,	2·6543	0·66	82·9	23·92	82·0	4·6640	2·09	83·4	23·86	82·0	·00253		
,, 19	2·6547	0·61	84·6	24·81	83·3	4·6666	2·07	84·5	25·03	83·1	·00253	− ·00004	4·2042
,, ,,	2·6546	0·59	85·4	24·26	83·9	4·6670	2·10	85·3	24·04	83·8	·00253		
,, 26	2·6548	0·61	83·8	23·92	83·8	4·6665	1·94	84·8	23·98	83·7	·00254	+ ·00009	4·2064
,, ,,	2·6553	0·62	84·1	23·34	83·9	4·6668	1·87	83·5	23·40	83·9	·00254		
Sept. 2	2·6547	0·66	85·2	23·55	83·3	4·6645	1·87	84·8	23·75	83·0	·00254	+ ·00009	4·2082
,, ,,	2·6549	0·64	85·2	23·30	84·0	4·6659	2·19	84·8	23·27	83·8	·00254		
,, 9	2·6545	0·66	85·9	23·65	83·0	4·6682	2·11	85·9	23·72	83·0	·00255	+ ·00001	4·1995
,, ,,	2·6542	0·63	85·7	23·60	82·9	4·6672	2·11	85·0	23·57	82·7	·00255		
,, 16	2·6622	0·71	86·4	22·03	84·2	4·6711	2·11	86·0	22·36	84·0	·00254	− ·00009	$\boxed{4{\cdot}2221}$
,, ,,	2·6620	0·66	86·3	20·69	84·8	4·6756	2·17	86·0	20·31	84·6	·00254		
,, 23	2·6559	0·66	87·6	23·46	85·0	4·6756	2·01	87·5	23·48	84·9	·00255	− ·00009	4·1963
,, ,,	2·6598	0·66	87·4	22·84	85·1	4·6757	2·00	87·1	22·73	85·0	·00255		
,, 30	2·6599	0·72	86·9	23·51	83·8	4·6777	2·40	87·0	23·74	83·2	·00255	+ ·00010	4·2003
,, ,,	2·6605	0·71	86·7	23·13	84·0	4·6778	2·23	86·7	23·12	84·0	·00255		
Oct. 7	2·6605	0·77	87·9	23·38	84·9	4·6762	2·26	87·8	23·72	84·8	·00255	+ ·00040	4·2034
,, ,,	2·6608	0·74	86·8	22·93	84·7	4·6766	2·23	86·1	23·15	84·7	·00255		
,, 14	2·6596	0·72	87·6	24·05	86·1	4·6753	2·18	88·3	24·14	85·9	·00256	·00000	4·2054
,, ,,	2·6605	0·77	88·0	23·57	87·1	4·6763	2·15	87·3	23·61	86·6	·00256		

The times of one vibration given in column 2 are corrected for rate of Chronometer and for that alone.

The determination of September 16 was rejected because a magnetic disturbance was taking place during the observations. Those of July 8 and 15 were deduced from the first observations of the kind made by the observers, and appear to be affected by some systematic error of procedure, the nature of which I cannot conceive, nor can they give any clue to it: it would however be obviously wrong, regarding the general consistency of the determinations that follow, to include, in calculating the mean, two values differing so widely, and lying apart from the rest, at the commencement of the series of observations: they have accordingly been rejected. The mean of the remaining thirteen determinations is 4·2030, which has a probable error of ·00016 of its whole value; and the probable error of a single weekly determination is ·0025 of a unit moment of inertia.

$$\text{Then } K' = K_m \left\{ 1 + 2\epsilon' (35^\circ - 80^\circ) \right\} = 4{\cdot}2030 \times {\cdot}99937 = 4{\cdot}2004.$$

[The observations for the determination of K_m have also been reduced up to the end of 1870, giving the following values:—

4·2085	4·1905	4·1814	4·1985	4·1960
4·1986	4·1994	4·1960	4·2113	4·1942
4·1917	4·1954	4·2136	4·2031	4·1964
4·1959	4·2001	4·1991	4·2109	4·2044
4·2053	4·1916	4·1887	4·2029	4·2062
4·2024	4·1812	4·2072	4·2061	4·2111
4·2040	4·1786	4·2017	4·2208	4·2024
4·2050	4·1875	4·2185	4·2244	

The mean of all the fifty-five determinations—sixteen before and thirty-nine after the 16th October 1868—is 4·2011, which is ·00045 of its whole value less than that adopted (4·2030). The value found at the Kew Observatory—having the weight of a single determination—was 4·2071.

The difference between the extreme values of the fifty-five is quite ten times as great as the observational errors could possibly give rise to, and I am driven to the conclusion that the times of vibration of the magnet *with* the inertia cylinder are affected by some cause, at present unexplained, which the theory of the experiment does not take into account. The moderate value (about ·0006 of the whole) of the probable error of a single determination of Horizontal Force, found further on, shows that the times of vibration of the magnet *without* inertia cylinder are not affected by the same cause, or, if so, in a very slight degree.

I may remark here that similar but very much larger irregularities are found by the M.M. Schlagintweit in their determinations at different times of the moment of inertia of the same vibration magnet. A table of twenty-eight values is given on page 284 of Vol. I. of their "India and High Asia," the probable error of one of which is ± ·0143 of the whole, and of the mean value ± ·0027 of the whole. To those who are conversant with the delicate nature of the observations, it will be hardly conceivable that differences of such a magnitude should arise from errors of observation of any kind, and the only explanation of them that is then left open is that the theory of the experiment is, in some respect, defective.

It appears from what has just been said that the probable error of the final result of a series of observations of Absolute Horizontal Force should be obtained by the combination of two subordinate probable errors, one depending on the accuracy of determination of the constant quantities which enter into the reductions, and the other depending on the combination of all the variable observational errors. In a series of observations of the same quality throughout the latter subordinate probable error diminishes as the number of observations increases, but the former is the same so long as the same constants are used, and it ultimately becomes the preponderating element in fixing the actual probable error. A time is ultimately reached, therefore, when the accuracy of the final result should be judged by it rather than by the probable error of observational quantities.]

Value of one division of the Collimator Scale of Magnet "N 23 a".—The instrument being mounted as in the observation of torsion force, the circle was turned until a high division of the scale was cut by the vertical wire of the telescope, and then to a low division,—the verniers of the circle being read after each setting. The difference of circle reading being then divided by the difference of scale reading the result was found to be sufficiently near to 2′·33, the value which was supplied from Kew, and which has been adopted.

Value of P.—It will be seen from the observation form for the deflection experiment that the observations at the two deflection distances ($r_0 = 0{\cdot}8$, and $r_0 = 1{\cdot}0$) correspond to the same mean time and therefore very nearly to the same value of X. Five series, each of twenty-five pairs of values of $\frac{m}{X}\left(1 + \frac{P}{r_0^2}\right)$ have been calculated from the observations for $r_0 = 0{\cdot}8$ and $r_0 = 1{\cdot}0$, and from each series has been determined an independent value of P—with the following results—

Date of Series.	Values of $\frac{m}{X}\left(1+\frac{P}{r_0^2}\right)$		Deduced value of P.	Mean value of P.
	$r_0 = 0{\cdot}8$	$r^0 = 1{\cdot}0$		
June 25 to October 16, 1867	·0949802	·0953035	− ·006088	−·006344
October 16, 1867, to January 15, 1868.	·0937229	·0940396	− ·006044	
January 15 to April 1, 1868	·0929180	·0932590	− ·006567	
April 8 to July 1, 1868	·0912742	·0915984	− ·006355	
July 1 to September 23, 1868	·0905351	·0908724	− ·006667	

The value that has been adopted is P = − ·00634

[The reduction of the observations up to the end of 1870 has afforded confirmation of the general accuracy of the adopted value of P, although discordances amongst the individual determinations still appear. The later results are as follows:—

Date of Series.	Values of $\frac{m}{X}\left(1+\frac{P}{r_0^2}\right)$		Deduced value of P.
	$r_0 = 0{\cdot}8$	$r_0 = 1{\cdot}0$	
September 30 to December 23, 1868	·0894808	·0897987	− ·006356
December 23, 1868, to March 10, 1869	·0888648	·0891949	− ·006648
March 17 to June 9, 1869	·0883894	·0887197	− ·006688
June 9 to September 2, 1869	·0876254	·0879448	− ·006522
September 8 to November 24, 1869	·0871425	·0874802	− ·006937
November 24 to December 29, 1869	·0868470	·0871589	− ·006426
	Values of $\frac{m}{X}\left\{1+\frac{{\cdot}00634}{r_0^2}+\frac{\Delta P}{r_0^2}\right\}$		
January 5 to March 30, 1870	·0874762	·0874782	− ·006381
April 6 to June 29, 1870	·0871224	·0871164	− ·006218
July 6 to September 28, 1870	·0865685	·0865605	− ·006176
October 5 to December 28, 1870	·0861390	·0861351	− ·006260

The mean of the fifteen determinations from June 1867 to December 1870, giving only half weight to that derived from the short series from November 24 to December 29, 1869, is P = - ·006422.

An examination of the above determinations of P,—the differences in which much exceed the effect of probable error in any individual observing operation,—leads to a suspicion that the advantage of maintaining the strength of the magnets,—by placing them side by side with contrary poles adjacent,—may be more than counterbalanced by variability thus induced in the distribution of their magnetism. Accordingly, the habit of keeping the magnets in the relative position described has been abandoned and the two magnets "N 23 *a*" and "N 23 *c*" are now never allowed to approach within a foot of any other magnets, or of each other when not in use.]

The errors of the thermometers have been determined by comparison with a Kew Standard Thermometer to be as follows:—

Thermometer used in vibration experiment, throughout the whole period from June 1867 to December 1870, error = + 1°·1.

Thermometer used in deflection experiment
from June 25 to December 18, 1867, error = + 1°·5
" December 18, 1867, to April 1, 1868, do. = + 1°·5
" April 1 to April 22, 1868 (not compared, but being of the same pattern as the last the error is assumed to have been) = + 1°·5
" April 22, 1868 to Decmber 31, 1870, error = + 2°·0

An example may be here given of the calculation for the year 1870, of the constants A and B. The means of the temperatures at which all the deflection and vibration experiments in the year were made are 85°·9 and 85°·6 respectively, and the mean of the greatest and least values of *a* during the year is $\frac{\cdot00891 + \cdot00565}{2} = \cdot00728$

$$\mu = \cdot000228\,;\ P = -\cdot00634\,;\ \log \pi^2 K' = 1\cdot61759\,;\ \tau_v = +\ 1^\circ\cdot1\,;\ \text{and}\ \tau_d = +\ 2^\circ\cdot0$$

$$A = \pi^2 K'\left\{1-(q+2\epsilon')\ \tau_v + [a]^2\right\} = \pi^2 K'\left\{1 - (\cdot0001993 + \cdot000014)\ 1\cdot1 + (\cdot00728)^2\right\}$$

$$\begin{aligned}\log A &= \log \pi^2 K' + \log(\cdot99982)\\ &= 1\cdot61751\end{aligned}$$

$$B = \frac{r_{\prime}^3\left\{1-(q+3\epsilon)\,\tau_d + [b]^2\right\}}{2\left\{1-\frac{2\mu}{r_0^3}+\frac{P}{r_0^2}\right\}}$$

Writing $B_{0\cdot8}$ and $B_{1\cdot0}$ for the values of B when $r_0 = 0\cdot8$ and $1\cdot0$ foot respectively,—

$$B_{0\cdot8} = \frac{(0\cdot8)^3\left\{1-3\,(\cdot00027)\right\}.\left\{1-(\cdot0001994+\cdot00003)\ 2\cdot0 + [\cdot0114]^2\right\}}{2\left\{1-\frac{2(\cdot000228)}{(0\cdot8)^3}-\frac{\cdot00634}{(0\cdot8)^2}\right\}}$$

$$\log B_{0\cdot8} = 9\cdot41246$$

$$B_{1\cdot0} = \frac{(1\cdot0)^3\left\{1-3\,(\cdot00027)\right\}.\left\{1-(\cdot0001994+\cdot00003)\ 2\cdot0 + [\cdot0114]^2\right\}}{2\left\{1-\frac{2(\cdot00028)}{(1\cdot0)^3}-\frac{\cdot00634}{(1\cdot0)^2}\right\}}$$

$$\log B_{1\cdot0} = 9\cdot70144$$

Observations of Absolute Declination.—The parts of the apparatus used in these observations are the same as for the vibration experiment, substituting only the collimator magnet (16) and plummet (17) for (8) and (10) respectively, and using a special suspension cap and thread, which latter is kept permanently under the same tension as when the magnet is suspended, by placing the cap when not in use on a bracket in a cupboard in the observing room with the plummet suspended. It may be mentioned here that the silk suspension threads of the vibration magnet and deflected magnet are, when not in use, kept similarly under tension; their plummets being suspended, and the suspension caps resting on a bracket in the same cupboard. At the conclusion, on each Wednesday, of the Horizontal Intensity Observations, the circle is turned, and the telescope set upon the Tardeo Chimney,—the wire bisecting the chimney, the breadth of which subtends at the instrument an angle of about 2′ 20″—and the verniers are read and the readings entered in the following form, in the column under "Tardeo Chimney," as made at the commencement of the observation of Declination.

Specimen Observation.

GOVERNMENT OBSERVATORY, BOMBAY.

OBSERVATIONS of ABSOLUTE DECLINATION made with the Kew Unifilar (Elliott Bros., No. 23) on December 3rd 1868.

No. of Observation 49 Chronr. Error = + 2½m.

Torsion.	Reading Sc. div.	Means and Diff.	
		90°	360°
0°			
+ 90			
+ 360	No	Torsion.	
0			
- 360			
- 90		Adopt. Effect of 90° Torsion.	
0			
		Sc. div.	

Civil Time by Chronr.		La. Decln. Magnr.	Collimator Magnet.		At	Reading of Verniers.			Tardeo Chimney.			Torsion.
			Scale apparently									
			Erect.	Inverted.								
h.	m.	Sc. div.	Sc. div.	Sc. div.		°	′	″	°	′	″	°
11	30	35·54	+ 2·10		Com-mencement.	17	12	0	196	52	30	0
11	32	35·54	+ 2·10				11	50	196	52	40	
11	37	35·53		+ 1·95	Mean.	17	11	55	196	52	35	
11	39	35·53		+ 1·90	Conclusion.	17	12	0	196	52	30	0
11	43	35·53	+ 2·15				11	50	196	52	40	
11	45	35·53	+ 2·15		Mean.	17	11	55	196	52	35	
11	49	35·53		+ 1·90	Mean of Means.	17	11	55	196	52	35	0
11	51	35·54		+ 1·80	′$\left(\frac{\text{Er.—Inv.}}{2}\right)$″		+	15	180	26	26	Azim. of T. Chimney.
	326	27	10	355		17	12	10	16	26	9	True Merid. Reading.
11	41	35·53	+ 2·12	+ 1·89	Correction for Torsion.			0				
11	38½	Mean.	+ 1·89	Sc. Inverted.		17	12	10				
Mean of Times Corrected.			+ 0·23	Er.—Inv.	True Merid. Circle Reading.	16	26	9				
			+ 0·11	$\frac{\text{Er.—Inv.}}{2}$	Absolute Decln. E.	0	46	1				
			+ 15″	Converted.	Observer.	C. G. T.						

The circle is then turned to make the telescope point Southward, and the special suspension cap and thread are placed on the glass tube, the plummet is suspended, two small vessels of quick lime are placed inside the box to dry the air, and the box is then closed and left till next day. The plummet is then found at rest and the torsion circle is turned until, after one or more trials, the cross bar of the plummet is seen to vibrate equally on both sides of the position which the magnet will take up when suspended. When this is done the reading 0° is entered under the column "Torsion" as measured at the commencement of the observation. The magnet "N.23 *b*" is now suspended with the scale appearing erect in the field of the telescope and with care to avoid the introduction of torsion into the thread; and having been brought to rest by the small hand magnet, the circle is turned and the telescope set by means of the tangent screw, as nearly as is practicable upon the division + 1·6 of the collimator scale. It has been found—by inversion of the magnet and scale—that the line joining the centre of the lens of the magnet and this division is very nearly parallel to the magnetic axis of the magnet; and the value of one division of the scale, determined as in the case of the vibration magnet, is 2′·30. The readings of the verniers are now taken and entered in the form "at commencement." Next a reading of the scale is made and entered under "erect," the corresponding time by chronometer, and reading of the Large Declination Magnetometer, being observed simultaneously and entered in the same horizontal line. These readings are then repeated.

The magnet is now taken off and turned 180° about a horizontal axis, and is again suspended by its other socket, the scale then appearing inverted, and the readings increasing from right to left instead of from left to right as before. In this position of the magnet two more sets of readings are taken; the magnet is again turned with scale-erect and finally with scale-inverted, two sets of readings being made after each inversion. After eight sets of readings have been thus obtained the verniers are again read—no change having been made on the tangent screw since the last vernier readings were made—and the readings entered as "at conclusion." Now the magnet is let down, by the rack and pinion, so as just to rest on the bottom of the box, when a clear view is obtained through the windows of the box; and the telescope is set upon the Tardeo Chimney and the circle reading "at conclusion" is entered. Next the plummet is suspended and the amount of torsion (if any) estimated in degrees: this is facilitated by a paper circle with radial lines, made by the First Assistant, and glued to the bottom of the box. If a sensible amount of torsion is found, the magnet is suspended again, and the torsion force measured, as in the vibration experiment, and the observations are entered in the form on the left hand top corner of the page.

At the conclusion of the observation the means, indicated on the form, are calculated, viz:—of the effect of 90° Torsion;—of time by chronometer, which is then corrected for error of chronometer;—of the readings of the Large Declination Magnetometer;—of the scale readings, erect and inverted;—of the vernier readings with circle set for the magnet, and for the Tardeo Chimney;—and of the amount of torsion: also the value of the

$$\frac{\text{scale reading 'erect' } \textit{minus} \text{ scale-reading 'inverted'}}{2} \times 2'{\cdot}30$$

or the half difference converted into minutes and seconds, is applied as a correction to the mean of the vernier readings, and the correction for torsion is applied: the known azimuth of the Tardeo Chimney is entered, and the true meridian reading found, and deducted from the corrected reading of verniers, to give, as a final result, the Absolute Easterly Declination corresponding to the mean reading of the Large Declination Magnetometer, and nearly to the mean time of the observation.

The parallelism of the surfaces of the glass windows of the vibration box was tested by viewing the Tardeo Chimney, first with the box in position, and then with the box removed: the displacement of the chimney, if there was any, was scarcely perceptible. Occasionally, owing to haziness of the atmosphere, the Tardeo Chimney could not be seen. The mark in the Electrometer Tower was then observed instead, but as the same focussing of the telescope would not serve both for the mark and the collimator scale of the magnet, the observations of each object were made both with the telescope level above and with telescope level below, thus eliminating any difference of collimation at the different focussings. As soon after as possible—generally next day—the horizontal angle included between the mark and the Tardeo Chimney was similarly observed, that is, with telescope level above and below, and the previous observations of the mark reduced by that angle. Such observations on hazy days are those of January 21, June 24, and July 22, 1869.

Fixed Reference Marks.—The adopted azimuth of the Tardeo Chimney, as also that of the spire of St. John's Church, depends upon that of the Kennery Light-house, which being visible by night as well as day, could be observed immediately before and after fixing absolute azimuthal readings upon the instrument, by observing suitable stars therewith. No suitable instrument for this purpose exists among the Observatory stores, and I am indebted to the kindness of Lieutenant Carter, R.E., of the Great Trigonometrical Survey Department for the use, for three or four evenings, of a Troughton and Simms's 8 inch Theodolite, when, in 1867, he was passing through Bombay *en route* to Abyssinia. This instrument was placed on the pillar used for the Horizontal Intensity and Absolute Declination observations, and carefully levelled. The stars observed were *Polaris*, *δ Ursæ minoris*, and 51 *Cephei*, and the stars were bisected by the vertical wire of the telescope,—and the time recorded,—alternately with the illuminating lamp east and west; that is, the horizontal circle reading was altered by about 180° between every two settings. By this means and by making as many settings with lamp east as with lamp west, the collimation error was completely eliminated, and the level error partially so, the remaining level error, that due to the axis of the instrument as distinguished from that due to difference of elevation of the Y's which support the telescope, was measured each evening, but being so small as to produce, in the worst case, an error of only 1″ in the azimuth, it has been applied only in that case,—the last day,—to the mean vernier readings.

In the following table are shown the True Bombay Mean Time of the observations, and the corresponding means of the three vernier readings:—

1867. Date.	Object observed.	Lamp.	True Bombay Mean Time.	Mean Reading of Verniers.	Azimuth of object, E. or W. of North.	Circle Reading for True North. Lamp to left.	Azimuth of Kennery Light. East of North.
			h. m. s.	° ′ ″	° ′ ″	° ′ ″	° ′ ″
Dec. 4	δ *Ursæ Minoris.*	East	8 29 7	182 0 0	3 24 52 w.	5 24 30	179 49 35
,, ...		Do.	8 36 19	182 2 3	3 22 43 w.		
,, ...		West.........	8 44 55	2 4 15	3 19 54 w.		
,, ...		Do.	8 50 17	2 6 3	3 17 59 w.		
,, ...		Do.	9 6 47	2 12 40	3 11 30 w.		
,, ...		East	9 14 4	182 16 42	3 8 19 w.		
,, ...	Kennery Light.	To left	8 47	185 13 3			
,, ...		To right ...	9 8	5 14 32			
Dec. 5	*Polaris*	East	14 52 52	183 57 53	1 27 8 w.	5 24 34	179 49 31
,, ...		West........	15 3 14	3 57 47	1 26 25 w.		
,, ...		Do.	15 20 30	3 59 25	1 24 50 w.		
,, ...		East	15 28 21	184 0 52	1 23 57 w.		
,, ...	Kennery Light.	To left	15 0	185 13 43			
,, ...		To right ...	15 24	5 14 28			
Dec. 6	δ *Ursæ Minoris.*	East	7 31 15	183 39 52	3 34 8 w.	7 13 50	179 49 21
,, ...		West.........	7 41 3	3 40 17	3 33 32 w.		
,, ...	51 *Cephei*	East	7 34 45	190 9 11	2 55 10 E.		
,, ...		West.........	7 37 47	10 8 44	2 55 13 E.		
,, ...	Kennery Light.	To right ...	7 15	7 3 38			
,, ...		To left	7 33	187 2 45			
Mean Azimuth—East of North—of Kennery Light, giving weights 3, 2, and 2 to the 1st, 2nd and 3rd determinations respectively........							179 49 30

On the 4th December, the same instrument was directed successively to the Tardeo Chimney, the spire of St. John's Church, and the Kennery Light-house, giving the following mean readings of the verniers of the circle :—

Lamp.	Tardeo Chimney.	St. John's Church.	Kennery Light-house.	Horizontal angle, reckoned from Kennery in direction N. E. S. W. N.—between Kennery Light-house and	
				Tardeo Chimney.	St. John's Church.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
To right.........	5 20 53	25 37 15	184 44 23	180 36 30	200 52 52
To left	185 20 13	205 36 27	4 43 23	180 36 50	200 53 4
Clamp of Lower Horizontal circle loosed, and circle turned about 180°, and clamped again :—					
To left	5 20 18	25 36 40	184 43 28	180 36 50	200 53 12
To right	185 21 15	205 37 30	4 44 38	180 36 37	200 52 55
			Means.........	180 36 42	200 53 1

The considerable differences that appear in the circle readings for the Tardeo Chimney, made during the observations between June 27 and December 24, 1867, being much too great to be attributed to error of observation, it was found on examination of the instrument that those differences were mainly caused by the adjustment for level which was frequently repeated, of the feet of the circle. The bottom ends of the screw feet, which rest in grooves with inclined sides, and which were previously conical in shape, were carefully turned to a hemispherical form ; and the adjustment for level being once made on the 15th January 1868, was not afterwards disturbed for a year. This is allowable, seeing that so great a level error as 15′ would produce a maximum error of circle reading of only 1″.* From the same date the readings were observed regularly, after each weekly observation of Declination, of the Tardeo Chimney, both with the telescope level above and below, and similarly of the Kennery Light-house, and mark in Electrometer Tower:—except when the Kennery Light-house was invisible from haziness of the atmosphere. Between the 16th January and 5th November 1868 twenty-eight such sets of readings were obtained, giving the mean value of the horizontal angle between the Kennery Light-house and the Tardeo Chimney as 180° 36′ 57″, and indicating a real small change,—affecting all the three objects in the same direction,—in the position of the instrument; such as might be expected from a slight twisting of the wooden pillar by changes in the hygrometric condition of the air. Suspecting that the difference of 15″ in the determinations—with the Theodolite and with the Kew Unifilar Circle,—of the angle between Kennery and the Chimney might be due to error of graduation of the latter circle, I made three sets of similar observations to those just described, but shifting the feet of the circle between each set so as to cause a rotation of the circle of about 120°: the three mean values thus found were 180° 37′ 18″ (in the usual position of the circle), 180° 37′ 2″, and 180° 37′ 5″—and the mean of all was 180° 37′ 9″. These values, although indicating a slight error of graduation of the kind sought, are all larger than either of the former determinations. It may be indeed that the differences in the three determinations are due to lateral refraction, for the line of sight towards Kennery has the sea on both sides, whilst that towards the Chimney has the Back-Bay on one side and land for a considerable distance on the other. In any case the mean of the three determinations, giving double weight to that derived from the twenty-eight weekly observations, will have a much smaller error than the probable error of a single determination of absolute Declination, and this value has been adopted, viz:—180° 36′ 56″—obtained as follows:—

Determination with Theodolite—with weight	1—	180°	36′	42″
Do. Kew Unifilar do.	1—	180	37	9
Mean—with weight	2—	180	36	55
Do. given by twenty-eight weekly observations—with weight	2—	180	36	57
Adopted mean.		180	36	56

Adding to this the azimuth of the Kennery Light-house, we have 180° 36′ 56″ + 179° 49′ 30″ = 0° 26′ 26″ = Azimuth of Tardeo Chimney, East of North,

or 180° 26′ 26″ = do. do. West of South,

which is the value used in reducing the observations.

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* It may be remarked here, that as the levelling screws have never been touched in the course of an observation, the fault just described will not at all affect the accuracy of the observations.

Remarks on the Tables of Observations of Absolute Horizontal Force.

The entries in columns 1 to 16 and 18 are copied directly from the computation form; column 17 is given to show the degree of accordance existing in the determinations from deflections with the deflecting magnet at the respective distances 0·8 foot and 1·0 foot from the deflected magnet.

1867, July 27.—It was discovered that the observers had since the 3rd July failed to adjust the suspended magnet,—in the deflection experiment,—to the same height as the deflector magnet. The determinations for this period although given above, are therefore rejected in the calculation of the monthly mean. The mean adopted for July includes the determinations of June 25 and 26 and the two of July 31.

July 31.—The magnet "N 23 *c*" was readjusted to horizontality.

December 18.—The deflection observations were rejected because in the first experiment the deflector magnet "N 23 *a*" was found to have become loose and been shifted in its socket; and in the second the observer neglected to adjust the deflected magnet "N 23 *c*" for height. The magnet "N 23 *a*" was balanced afresh and screwed fast in its frame,—the vertical scale reading + 15·7. The value of *m* for this date is interpolated from the values of the 11th and 20th December, and the values of X are derived from this and the vibration observations. Two monthly means are given, the one, enclosed within brackets, including these values with half the weight of complete independent determinations, the other excluding them: similarly the half-yearly value within brackets includes the bracketed mean value for the month of December.

December 18.—Deflection thermometer broken.

1868. March 4.—Found that the suspended magnet was sensibly inclined and that the image of the scale was thrown high in the field of the telescope: re-adjusted to horizontality and rectified inclination of mirror after deflection observations had been taken.

March 5.—Found that the deviation from horizontality of the deflection magnet was owing to misplacement by the observer of the fixing nut. Made a special mark on the nut on the side to be directed northward. The suspension thread of the vibration magnet had been carelessly fastened so that some fibres hung loose whilst the whole weight had to be supported by the remaining fibres, and these, instead of being collected into a compact bundle, were held by the suspension pin sensibly apart. It is suspected that this thread had been in use from February 5 to March 4. It was rectified before making the observations of March 5. A thread so fixed would partake of the character of a bifilar suspension, but this characteristic would not affect the observed effects of 360° of torsion, whilst it would increase the effects of 90° of torsion: it was therefore, for security against the future use of a thread so fixed, that after September 30, 1868, the torsion effects were always observed both with 360° and 90° of torsion introduced into the thread.

April 1.—After the observations—the observer accidentally fell downstairs and broke the deflection thermometer and cracked, at the side, the lens of the vibration magnet "N 23 *a*," but not so as to interfere with its usefulness.

April 8 and 16.—Considering the remarks of April 1 and April 20, and the very large values of X found from the observations of these dates (April 8 and 16), I think there can be very little doubt that, although unnoticed, when the magnet fell on the 1st April, the screw which fixes the magnet "N 23 *a*" to its frame was loosed: consequently the vibration and deflection observations cannot be regarded as comparable, seeing that the magnet has probably changed its position in the frame in the course of the sets of observations: the values of X found on these days are therefore rejected in calculating the adopted monthly mean; but the monthly and yearly means, including those values, are also given within brackets.

April 20.—In wiping the scale of the vibration magnet "N 23 *a*" the fixing screw came loose, and the magnet had to be re-adjusted in its frame, the reading of the vertical scale being at the completion of the operation + 16·5.

April 22.—Deflection thermometer broken by observer after completion of observations.

July 15.—During the first vibration experiment it was noticed that a magnetic disturbance was taking place; the observations were therefore stopped and resumed next day: an interpolated value of *m* is used for the reduction of the one vibration observation, and the resulting value of X is included with half the weight of a complete independent determination, in the monthly mean enclosed within brackets, but not in the other.

August 19.—An error of 8′ in the value of the second observation of *u*′ was found after the results had been fully worked out: the necessary corrections of *m* and X are marked, in small figures, over the erroneous values, but have not been applied.

September 30.—One of the eight observed readings of verniers was suspected to be erroneous and was increased by 10′. With this alteration a constant difference of about 2′ exists between each of the eight readings, and the corresponding readings of the previous week's observation; and the usual relation is produced between the angles of deflection at distances 0·8 and 1·0 foot.

December 16.—Before observing, the observer found the scale of the vibration magnet "N 23 *a*" much unscrewed: after it was screwed tight, he found the horizontal scale right, with the reading of the vertical scale + 14·0.

December 23.—The observer found the scale of the vibration magnet not quite horizontal: after completing the observations he turned the magnet a little in its socket without loosing the fixing screw, leaving the reading of the vertical scale + 16·0.

1869, July 21.—An evident error of 10′ in one of the eight readings of verniers, in the deflection experiment, was corrected before taking the means.

September 2, 8, 22, and 29, and October 6.—The observations on these days were taken whilst a fire engine was being employed to pump water out of the new magnetograph room: the average distance of the fire engine from the observing pillar would be about 70 feet.

Remarks on the Tables of Observations of Absolute Declination.

The description given of the observation of Absolute Declination will render clear the meaning of the numbers entered in each column: all of them except the monthly means, in column 10, are taken directly from the observation form described above.

For the same reason as in the vibration experiment the torsion force was measured—when necessary—after the 18th March 1868, by introducing twists of 90° as well as of 360° into the suspension thread.

The instrument was adjusted for level on the following dates:—

January 15, 1868; January 15, 1869; and October 20, 1870: and on the 24th November 1868 the lenses of the telescope were cleaned and replaced, causing a change in the collimation error.

1869, September 3, 23, and 30. The Observations on these days were taken, whilst a fire engine was being employed to pump water out of the new magnetograph room: the average distance of the fire engine from the observing pillar would be about 70 feet.

Kew Dip Circle.

At the same time with the Unifilar Magnetometer, a new Dip Circle which had been examined and tested at the Kew Observatory was received—through the Kew Committee—and was brought into use at the end of April 1867. It was made by Barrow, of London, and is numbered 49, and it had two 3½ inch needles numbered respectively 1 and 2. The instrument consists of a horizontal circle (6 inch) reading by a vernier to *one minute*, and supporting a revolving plate which carries a 6 inch vertical circle with two verniers,—also reading to *one minute*,—and microscopes, and a pair of vertical pillars with **Y**'s for lifting the needle. The pillars with the needle are enclosed in a mahogany box with two glazed sides—6 inches square—one of which forms a hinged door: and both pillars have vertical slots cut in them to admit of the lower point of the needle being observed when the needle is vertical. The **Y**'s are fixed at the top of sliding pieces which are moved simultaneously up and down grooves in the pillars by means of a milled-screw-head outside the box. To the tops of the pillars are fixed two pieces of agate with horizontal rounded upper edges, upon which the axle of the needle rests at the moment of observation, whilst the needle is free when disturbed to swing between the pillars. The upper edges of the pieces of agate are adjusted to lie in the same horizontal plane; and the lifting slides and **Y**'s so as just to raise the needle off the agates, but distinctly so, when at their upper limit of movement; and also to lift the needle simultaneously at both ends of the axle. The part of the axles of the needles upon which the needles rest is of cylindrical form (about ·018 inch in diameter), and has a beautifully polished surface upon which no irregularities can be detected when examined with a microscope magnifying linear dimensions twenty-six times. The horizontal circle carries a spirit level and has three screw feet for levelling. The vertical circle carries its microscopes—the fields of which are bisected by spider lines directed towards the centre of the circle—on the same arms as the verniers. Both circles have clamps and tangent screws for fine adjustment. The spot at which the observations of Inclination have been made is at the foot of the Electrometer Tower (**F**), at a distance of 25 feet from the Large Declinometer, the nearest of the Magnetometers; in this position it was found, by measuring the strength of a similar large magnet to that of the Large Declinometer, that the influence of the latter in increasing the observed dip could not be so great as 0′·1.—The support of the instrument is a solid heavy block of teakwood resting on the stone floor of the room. Having fixed the feet of the circle in holes on the top of this pillar,—which is 50 inches high,—the upper vernier of the vertical circle is set at 90°, and a series of observations made to find what must be the reading of the horizontal circle when the magnetic axis of the needle swings in the vertical plane at right angles to the magnetic meridian plane. First, the horizontal circle is turned until the wire of the upper microscope bisects the upper end of the needle, and the horizontal circle is read; a reading is similarly made when the wire of the lower microscope bisects the lower end of the needle: these two readings are repeated with the face of the circle reversed in azimuth; the last four when the face of the needle is reversed in azimuth; and the last eight when the lower vernier is set at 90°; the mean of the sixteen readings is the reading sought; and as the horizontal circle is numbered from 0° to 90° successively, the same reading, but with the azimuth of the circle differing by 90°, will be that of the horizontal circle when the magnetic axis of the needle lies in the plane of the magnetic meridian. This observation has been repeated,—both with the poles of the needles direct and reversed—from time to time, and has always given the mean reading 65° 45′, or sufficiently near that to show that no sensible error will result in the observed dip by adopting that reading for many years, at the present rate of secular change of Declination, and so long as the instrument is unchanged: it has accordingly been adopted throughout the period of observation.

A regular observation consists of the following operations:—

1st. Having set the horizontal circle to the reading 65° 45′, with the face of the vertical circle to Eastward, the verniers are turned until the wire of the upper microscope bisects the upper end of the needle, and the upper vernier is then read.

2nd. The wire of the lower microscope is similarly made to bisect the lower end of the needle and the lower vernier is read.

Similar readings are taken for different positions of the circle and needle as shown (including the above) in the following form and in the order there indicated:—

Poles of needle.	One end dipping								The other end dipping							
Circle Facing.	East.				West.				East.				West.			
Needle Facing.	East.		West.		East.		West.		East.		West.		East.		West.	
End of needle observed.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.	Upper.	Lower.
Order of observation—as to time	1	2	13	14	9	10	5	6	17	18	29	30	25	26	21	22
	3	4	15	16	11	12	7	8	19	20	31	32	27	28	23	24

After setting approximately, the needle is lifted several times and the tangent screw turned until a position of the microscope wire is gained, about which—as a mean position—the needle oscillates consistently after repeated liftings; this position is then adopted without the observer knowing what the reading of the vernier will be, and the actual reading is entered regardless of what may be the final result of the observation. The needle is not let down with extreme gentleness, but—at the moment before touching the agate supports—rather smartly.

The mean of the 32 readings is taken as the result of the whole observation.

From the 19th July 1867 the readings of the Large Horizontal Force Magnetometer and of the Vertical Force Magnetometer were taken at the beginning and end of each observation with each end of the needle dipping.

To magnetize the needle, ten passes are made, on each side, with a pair of large bar magnets: the needle is then wiped with a clean linen cloth, and the axle, which is made to pierce a fine cork, is rubbed with the cork; the needle is then examined to see that no particles of fluff or cork remain on it, when it is placed on the agate supports. The linen cloths and corks used are kept, the former in a box with cover, and the latter in an air-tight vessel, the air in which is kept dry by the exposure in it of some pieces of quick lime.

The observations were taken generally on Tuesday morning and Friday afternoon with one needle, and on the following Tuesday and Friday with the other needle, and so on alternately.

Great care—which is especially needful during the monsoon—has been taken to protect the needles from rust by surrounding them with a dry atmosphere. The importance of attention being given to this point, being known beforehand, the air-tight packing with which the needles had been provided before leaving the Kew Observatory was not removed until a suitable case had been provided for their preservation. This case consisted of a circular slab of teakwood, with a deep groove cut near its periphery partially filled with mercury, and an inverted bell-glass, whose rim fitted the groove, floating on the mercury. In this receptacle, which also contained a vessel of (frequently renewed) quick-lime for drying the air, the needles have been always kept when not in use.

Up to the 17th August 1867 the observations commenced with either end (A or B) of the needle dipping and without re-magnetizing the needle, *i. e.* the magnetization for the latter half of one observation was made to serve for the first half of the next observation with the same needle, and the two needles were kept during the interval with contrary poles adjacent in a zinc box: but after August 17, 1867, the needle was always re-magnetized so as to make the end "A" dip during the first half of the observation: it will be seen by a simple inspection of the observations that the effect of this change of practice was to produce a marked increase in the accordance of successive observations.

In March 1869 the axle of the needle No. 1 was accidentally broken by the observer; and after the 19th of the same month, when the last observation with that needle was taken, needle No. 2 was used regularly for both the weekly observations.

For some reason, not very evident at the time, the observations with the needle No. 2 suddenly began, after the 18th March 1870, to be of very inferior character to those previously obtained with it. Although the needle was apparently in perfect order—and no change had been made in the conditions for securing satisfactory observations—yet its indications were comparatively unsteady, for it failed to take up—as it had formerly done—a definite and consistent position after repeated liftings. The observers declared that they had in no way departed from the ordinary course of procedure, and could give no clue to the cause of the change.

A new pair of needles was ordered from England in March 1869, but difficulty was found in procuring these, and it was not till June of the following year that a single needle reached Bombay, and that one of the first productions of a new artist. Being in England at the time that this needle (No. 13, by Adie) was under trial, I had opportunity of observing with it myself at the Kew Observatory, and found it to behave well: nevertheless its performances at Bombay have been very inferior to those of the needles Nos. 1 and 2, by Barrow, during the years 1867 to 1870. The first observation with the needle No. 13, by Adie, was taken on the 6th June 1870.

A careful examination, in January of this year, of the axles of the needles, No. 2 by Barrow, and No. 13 by Adie, with a microscope of suitable power, has revealed a probable cause of the deterioration of the former and imperfection of the latter. For whilst the general polished surfaces of both the axles appeared beautifully smooth and uniform, they were seen to be scored in odd places with irregular spirals—the latter needle slightly—such as might arise from some hard grit having got upon the cork with which the axle was rubbed for the purpose of cleaning it.*

For greater security in this respect it has therefore been arranged that new needles recently received shall be observed in the fourth storey of the Electrometer Tower instead of at the basement; for near the ground, in the dry season, sand-dust is blown about in sensible quantities.

Remarks on the Tables of Observations of Inclination, 1867 to 1870.

Tables XVIII. to XXI. contain every complete observation made up to the end of 1870, and show as well as the mean dip, the partial results in each position of the circle, and with each end of the needle dipping, and also the mean weekly and mean monthly values.

The observers' initials, in these as in the other tables of absolute magnetical observations are:—

C. C.—of Mr. C. Chambers.
F. C. or F.—of Mr. F. Chambers.
C. G. T. or C.—of Mr. Crishnajee Gunesh Thacoor.
R. S. M. or R.—of Mr. Ramcrishna Sukharam Moghey.
P. L. D. or P.—of Mr. Purshram Luxooman Datar.

In other respects the headings of the several columns are sufficiently explanatory of the numbers entered under them.

The meridian reading of the azimuth circle was determined as follows:—

1867, April 29—65°·45′; 1868 January 21—65° 48′; January 31—65° 45′;

1870, January 7—65° 55′; January 11—65° 48′; value adopted throughout the period 65° 45′.

The observations on the following dates were taken whilst a fire engine was being employed to pump water out of the new magnetograph room, viz.—on September 3, 10, 21, 24 and 28, and on October 1; the average distance of the fire engine from the observing pillar would be about 50 feet.

On March 18 and 23, 1869, the values 19° 17′·3 and 18° 44′·9 were observed experimentally with the needles weekly magnetized; and being very discordant they have not been included in the general means: neither has the value 19° 14′·7 found on March 18, 1869, as its large departure from the normal results leads to a suspicion of some observational error.

The effect of the presence, near the Magnetic Observatory, of the fire engine appears to have been slightly to increase the values of Horizontal Force found for September 1869, and to diminish the Dip, but not to alter sensibly the Declination.

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* This surmisal as to the cause of the scorings appears not to be the correct one, for the axles of the new needles are similarly scored, though less deeply than No. 2 by Barrow, whilst fresh from the maker's hands and before they have been touched with cork.—*20th September* 1871.

TABLES OF RESULTS

OF

METEOROLOGICAL OBSERVATIONS,

1865 to 1870.

Barometric Pressure, 1865.

TABLE I.—*Mean Height of Standard Barometer (No. 58,) Corrected for Temperature, for each day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1865.	MONTHS.											
Date	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·910	29·910	29·903	29·683	29·592	29·550	29·703	29·742	...	29·741	29·898
2	...	·950	·908	...	·741	·620	...	·676	·807	29·868	·739	·884
3	29·962	·952	·877	·889	·774	·621	·496	·693	...	·882	·821	...
4	30·005	·923	·861	·903	·789	...	·518	·706	·789	·902	·880	·900
5	29·998	...	...	·896	·776	·636	·514	·731	·742	·898	...	·876
6	·978	·879	·892	·842	·789	·642	·589	·694	·746	·880	·894	·903
7	·969	·903	·883	·836	...	·644	·655	...	·777	·884	·908	·915
8	...	·873	·839	·841	·757	·694	·608	·658	·767	...	·893	·895
9	·968	·860	·831	...	·727	·685	...	·646	·704	·907	·892	·898
10	·970	·873	·861	·805	·775	·664	·624	·615	...	·905	·878	...
11	·973	·882	...	·775	·776	...	·682	·577	·745	·901	·888	·938
12	·973	...	...	·797	·802	·721	·658	·591	·744	·887	...	·939
13	·986	·891	·893	·832	·819	·671	·636	...	·714	·864	·887	·914
14	30·005	·882	·872	·822	...	·612	·658	·635	·720	·884	·916	·932
15	...	·931	·883	...	·734	·604	695	·657	·741	...	·935	·950
16	·039	·982	·922	...	·743	·663	...	·705	·773	·851	·956	·928
17	·028	·976	·934	·743	·785	·664	·672	·720	...	·819	·945	...
18	·009	·923	·902	·788	·775	...	·677	·728	·779	·830	·970	·887
19	29·969	...	...	·805	·778	·666	·652	·702	·804	·831	...	·886
20	·958	·916	·887	·753	·737	·727	·641	...	·820	·840	·963	·917
21	·974	·911	·895	·722	...	·753	·642	·668	·799	...	·879	·978
22	...	·880	·863	·758	·743	·767	·646	·612	·779	...	·867	·999
23	30·014	·862	·846	...	·764	·763	...	·556	·786	·789	·915	·988
24	·001	...	·813	·755	...	·736	·732	·594	...	·786	·925	...
25	29·977	·921	·827	·752	·707	...	·764	·656	·819	·773	·895	...
26	·956	·933	...	·767	·692	·712	·753	·683	·885	·813	...	·914
27	·926	...	·857	·766	·712	·713	·734	·695	·915	·817	·875	·899
28	·898	·913	·842	·747	·709	·650	·768	...	·887	·820	·876	·886
29	...		·862	·694	...	·598	·784	·722	·859	...	·894	·894
30	·890		·872	...	·596	·587	...	·712	·857	·805	·907	·940
31	·874		·886		·588		·719	·657		·776		...
Monthly Means.	29·972	29·910	29·874	29·800	29·741	29·669	29·656	29·666	29·788	29·848	29·890	29·918
Annual Variation.	+ ·161	+ ·099	+ ·063	— ·011	— ·070	— ·142	— ·155	— ·145	— ·023	+ ·037	+ ·079	+ ·107

	in.
Mean of months from January to March and October to December	29·902
Mean of months from April to September	29·720
Mean for the Year	29·811
The greatest monthly mean (that of January)	29·972
The least monthly mean (that of July)	29·656
Difference...........	0·316

Barometric Pressure, 1865.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year, or the excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	0·000	+0·005	+0·012	+0·004	+0·001	+0·010	−0·002	+0·012	+0·003	+0·003	−0·007	+0·003	+0·004
1 A.M.	− ·004	− ·011	− ·005	− ·006	− ·011	− ·009	− ·014	− ·007	− ·014	− ·008	− ·017	− ·011	− ·010
2 „	− ·016	− ·024	− ·018	− ·019	− ·020	− ·020	− ·027	− ·019	− ·027	− ·017	− ·027	− ·023	− ·021
3 „	− ·024	− ·031	− ·028	− ·029	− ·027	− ·033	− ·036	− ·029	− ·032	− ·025	− ·032	− ·033	− ·030
4 „	− ·022	− ·034	− ·027	− ·027	− ·023	− ·031	− ·037	− ·032	− ·030	− ·024	− ·030	− ·032	− ·029
5 „	− ·015	− ·011	− ·017	− ·015	− ·010	− ·023	− ·024	− ·023	− ·021	− ·012	− ·015	− ·022	− ·017
6 „	·000	− ·003	+ ·002	+ ·006	+ ·009	− ·002	− ·007	− ·006	− ·007	+ ·008	+ ·006	− ·004	·000
7 „	+ ·024	+ ·022	+ ·026	+ ·030	+ ·028	+ ·018	+ ·011	+ ·013	+ ·014	+ ·030	+ ·032	+ ·022	+ ·022
8 „	+ ·045	+ ·044	+ ·046	+ ·052	+ ·044	+ ·030	+ ·023	+ ·028	+ ·033	+ ·047	+ ·056	+ ·046	+ ·041
9 „	+ ·063	+ ·060	+ ·063	+ ·062	+ ·052	+ ·044	+ ·034	+ ·038	+ ·049	+ ·058	+ ·069	+ ·071	+ ·055
10 „	+ ·064	+ ·065	+ ·064	+ ·062	+ ·049	+ ·046	+ ·038	+ ·039	+ ·051	+ ·057	+ ·063	+ ·069	+ ·056
11 „	+ ·047	+ ·049	+ ·049	+ ·049	+ ·040	+ ·038	+ ·034	+ ·033	+ ·042	+ ·039	+ ·041	+ ·051	+ ·043
Noon.	+ ·017	+ ·024	+ ·027	+ ·028	+ ·024	+ ·027	+ ·024	+ ·019	+ ·021	+ ·012	+ ·019	+ ·019	+ ·022
1 P.M.	− ·012	− ·002	− ·006	+ ·003	+ ·003	+ ·008	+ ·015	+ ·001	− ·003	− ·013	− ·018	− ·015	− ·003
2 „	− ·035	− ·029	− ·030	− ·022	− ·018	− ·010	+ ·001	− ·015	− ·024	− ·036	− ·040	− ·037	− ·025
3 „	− ·046	− ·046	− ·049	− ·043	− ·036	− ·026	− ·014	− ·029	− ·036	− ·052	− ·050	− ·047	− ·039
4 „	− ·046	− ·049	− ·053	− ·051	− ·046	− ·036	− ·023	− ·039	− ·038	− ·049	− ·048	− ·047	− ·044
5 „	− ·041	− ·041	− ·049	− ·055	− ·042	− ·037	− ·024	− ·034	− ·034	− ·041	− ·035	− ·040	− ·039
6 „	− ·032	− ·031	− ·037	− ·041	− ·032	− ·027	− ·015	− ·020	− ·022	− ·027	− ·021	− ·026	− ·028
7 „	− ·013	− ·015	− ·023	− ·024	− ·021	− ·015	− ·003	− ·007	− ·009	− ·007	·000	− ·006	− ·012
8 „	+ ·004	+ ·006	− ·004	− ·006	− ·006	·000	+ ·009	+ ·009	+ ·007	+ ·010	+ ·015	+ ·011	+ ·005
9 „	+ ·014	+ ·020	+ ·017	+ ·009	+ ·011	+ ·016	+ ·016	+ ·026	+ ·024	+ ·016	+ ·022	+ ·025	+ ·018
10 „	+ ·017	+ ·022	+ ·023	+ ·017	+ ·022	+ ·022	+ ·017	+ ·031	+ ·025	+ ·016	+ ·018	+ ·023	+ ·021
11 „	+ ·008	+ ·017	+ ·017	+ ·008	+ ·018	+ ·017	+ ·013	+ ·021	+ ·018	+ ·007	+ ·010	+ ·012	+ ·014

In the Mean Diurnal Variation for the year—

A Minimum occurs..................at 3 A.M.
A Maximum ....at 10 A.M.
A Minimum ....at 4 P.M.
And a Maximum ....at 10 P.M.

Temperature of the Air, 1865.

TABLE III.—*Mean Temperature of the Air for each Day of Bombay Civil Time; also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	75·4	77·6	79·6	87·2	89·1	82·6	84·3	81·7	...	77·3	78·7
2	...	75·2	78·1	...	87·2	88·9	...	83·8	81·9	80·3	79·8	78·6
3	76·2	76·2	78·5	81·3	86·8	88·3	83·5	80·4	...	79·0	78·6	...
4	77·7	78·4	79·4	81·5	87·2	...	81·4	79·4	81·8	77·0	78·5	80·4
5	77·4	...	...	81·6	87·0	86·7	82·7	80·6	82·2	76·8	...	80·6
6	76·9	79·6	77·6	82·2	87·8	87·2	80·8	81·4	82·0	78·7	82·4	80·0
7	75·5	78·1	78·0	83·0	...	86·3	81·7	...	80·5	80·2	80·5	80·7
8	...	76·6	78·1	84·0	88·1	84·3	79·9	82·6	80·7	...	79·1	80·2
9	76·6	78·0	78·1	...	88·1	81·9	...	82·9	80·3	81·3	78·6	78·9
10	77·4	75·5	79·3	86·0	88·2	82·2	82·8	81·8	...	80·4	78·2	...
11	75·9	74·6	...	86·9	88·0	...	83·4	82·3	82·6	80·9	78·4	75·6
12	75·6	...	...	85·5	87·3	83·6	83·2	83·2	82·4	81·9	...	75·0
13	77·8	75·6	77·1	85·7	86·7	83·4	83·3	...	81·7	81·4	76·8	75·5
14	77·4	76·3	76·7	85·6	..	84·0	84·1	78·4	81·3	81·9	76·9	74·5
15	...	76·5	78·9	...	86·9	84·0	83·7	77·7	80·4	...	78·3	75·4
16	75·9	77·3	79·2	...	86·6	86·5	...	77·1	81·0	81·6	78·6	77·0
17	76·3	76·4	78·3	85·6	85·8	86·6	82·8	76·9	...	83·4	79·4	...
18	77·7	75·9	79·1	85·3	86·6	...	83·7	78·3	79·7	83·7	80·9	77·1
19	79·4	...	...	85·4	86·9	87·6	83·7	79·1	80·1	84·1	...	76·4
20	79·3	78·4	81·4	85·8	87·7	87·5	84·1	...	81·5	83·0	79·4	77·5
21	79·2	78·2	81·9	85 9	...	86·3	84·3	78·4	80·9	...	77·4	77·2
22	...	78·7	81·1	86·8	87·4	83·6	83·9	78·7	79·8	...	75·7	76·6
23	78·8	78·2	80·6	...	87·9	84·6	...	78·9	80·8	82·4	77·6	75·9
24	79·4	...	81·9	86·8	...	85·5	84·4	78·6	...	82·1	80·2	...
25	79·0	77·9	81·6	86·3	88·3	...	84·3	81·0	81·0	83·1	78·7	...
26	77·8	75·3	...	86·5	88·4	85·5	78·5	81·1	81·7	82·0	...	75·7
27	76·3	...	80·5	86·8	88·5	86·2	82·5	81·1	81·5	82·2	77·0	73·5
28	75·8	78·6	80·7	86·8	88·8	86·5	81·5	...	81·9	81·1	78·5	73·2
29	...		81·9	86·7	...	82·9	81·6	79·8	81·4	...	80·1	75·3
30	79·0		81·2	...	89·5	80·9	...	79·5	81·5	77·2	79·6	74·7
31	75·0		80·1		89·4		84·4	80·0		77·3		...
Monthly Means.	77·3	77·0	79·5	84·9	87·6	85·4	82·8	80·3	81·2	80·9	78·7	77·0
Means Corrected.	76·6	76·3	78·8	84·2	86·9	84·7	82·1	79·6	80·5	80·2	78·0	76·3
Annual Variation.	−3·7	−4·0	−1·5	+3·9	+6·6	+4·4	+1·8	−0·7	+0·2	−0·1	−2·3	−4·0

	°
Mean of months from January to March and October to December	77·7
Mean of months from April to September	83·0
Mean for the year	80·3
The greatest monthly mean (that of May)	86·9
The least monthly mean (that of February or December)	76·3
Difference	10·6

Temperature of the Air, 1865.

TABLE IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month and for the whole Year, or the excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 3·4	− 3·2	− 3·3	− 3·1	− 3·2	− 2·0	− 1·6	− 1·4	− 2·2	− 2·2	− 3·7	− 2·8	− 2·7
1 A.M.	− 3 7	− 3·4	− 3·6	− 3·5	− 3·3	− 2·4	− 1·7	− 1·4	− 2·6	− 2·6	− 3·9	− 3·3	− 2·9
2 "	− 4·2	− 3·9	− 4·0	− 3·8	− 3·5	− 2·7	− 1·8	− 1·5	− 2·9	− 3·1	− 4·1	− 3·9	− 3·3
3 "	− 4·7	− 4·4	− 4·3	− 4·1	− 3 8	− 2·9	− 1·9	− 1·6	− 3·1	− 3·3	− 4·3	− 4·2	− 3·5
4 "	− 4 9	− 4·8	− 4·6	− 4 4	− 3·9	− 2·9	− 2·0	− 1·7	− 3·4	− 3·6	− 4·5	− 4·7	− 3·8
5 "	− 5·3	− 5·1	− 5·1	− 4·8	− 4·1	− 3·0	− 2·1	− 1·6	− 3·4	− 4·0	− 4·7	− 5·3	− 4·0
6 "	− 5·4	− 5·3	− 5·6	− 4·8	− 3·8	− 3·0	− 2·1	− 1·6	− 3·2	− 4·2	− 5·3	− 5·6	− 4·2
7 "	− 5·1	− 4·7	− 4·0	− 2·5	− 1·6	− 1·9	− 1·5	− 1·1	− 2·2	− 3·2	− 4·2	− 4·7	− 3·1
8 "	− 2·9	− 2·4	− 1·1	− 0·2	+ 0·3	− 0·6	− 0 5	− 0·4	− 0·9	− 1·4	− 2·2	− 2·3	− 1·2
9 "	− 1·1	− 0·1	+ 0·8	+ 1·4	+ 1·6	+ 0·7	+ 0·4	+ 0·5	+ 0·5	− 0·5	− 0·6	+ 0·2	+ 0·3
10 "	+ 0·9	+ 1·5	+ 2·6	+ 2·6	+ 3·0	+ 2 0	+ 1·3	+ 1·0	+ 1·6	+ 1·0	+ 1·0	+ 1·8	+ 1·7
11 "	+ 2·6	+ 3·3	+ 4 2	+ 3·7	+ 3·9	+ 2·6	+ 2·4	+ 1·7	+ 2·7	+ 2·4	+ 2·9	+ 3·1	+ 3·0
NOON.	+ 4·9	+ 5·1	+ 5·2	+ 4·8	+ 5·0	+ 3·3	+ 3·1	+ 2·3	+ 3·8	+ 3·8	+ 4·7	+ 5·5	+ 4·3
1 P.M.	+ 7·4	+ 6·2	+ 5·9	+ 5·7	+ 5·5	+ 3·9	+ 3·2	+ 2·8	+ 4·1	+ 5·1	+ 6·2	+ 6·3	+ 5·2
2 "	+ 8·0	+ 7·0	+ 6·4	+ 6·2	+ 5·8	+ 4·4	+ 3·5	+ 2·7	+ 4·4	+ 5·7	+ 7·4	+ 6·8	+ 5·7
3 "	+ 8·3	+ 7·3	+ 6·3	+ 6·1	+ 5·5	+ 4·5	+ 3·2	+ 2·2	+ 4·5	+ 5·8	+ 7·9	+ 6·6	+ 5·7
4 "	+ 7·3	+ 6·9	+ 5·6	+ 5·3	+ 4·9	+ 3·9	+ 2·2	+ 1·8	+ 4·3	+ 5·2	+ 7·5	+ 5·9	+ 5·1
5 "	+ 4·2	+ 5·3	+ 4·5	+ 3 5	+ 2·9	+ 2·7	+ 1·0	+ 1·2	+ 3·2	+ 3·5	+ 3·9	+ 2·8	+ 3·2
6 "	+ 1·8	+ 1·6	+ 1·4	+ 0·7	+ 0·2	+ 0·7	+ 0·3	+ 0·1	+ 0·6	+ 0·9	+ 1·8	+ 1·6	+ 1·0
7 "	+ 0·8	+ 0·3	− 0·1	− 0·9	− 0·4	− 0·6	− 0·5	− 0·4	− 0·3	+ 0·1	+ 0·7	+ 0·9	0·0
8 "	+ 0·1	− 0·4	− 0·8	− 1·5	− 1·9	− 1·2	− 1·0	− 0·8	− 0·8	− 0·7	+ 0·1	+ 0·2	− 0·7
9 "	− 0·8	− 1·5	− 1·4	− 1·9	− 2·4	− 1·7	− 1·1	− 0·9	− 1·3	− 1·2	− 1·1	− 1·0	− 1·4
10 "	− 2·0	− 2·4	− 2·2	− 2·2	− 2·7	− 1·8	− 1·2	− 0·8	− 1·5	− 1·6	− 2·3	− 2·0	− 1·9
11 "	− 2·8	− 3·1	− 2·8	− 2·5	− 2·9	− 1·9	− 1·4	− 1·2	− 1·8	− 1·9	− 3·4	− 2·7	− 2·4

Mean of the hours from 9 P.M. to 8 A.M. .... 77°·4 } Difference = 5°·8
Ditto ditto 9 A.M. to 8 P.M. .... 83 2 }

Ditto 24 hours .... 80·3

In the Mean Diurnal Variation for the year a Maximum occurs between 2 and 3 P.M. and a Minimum at 6 A.M.

Temperature of the Ground, 1865.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1865. MONTH.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the yearly Mean.
	°	°	°	°	°	°	°	°
January	77·2	-3·8	78·8	-3·2	81·9	-2·3	83·4	-1·1
February	76·8	-4·2	78·4	-3·6	81·3	-2·9	82·9	-1·6
March	79·3	-1·7	80·1	-1·9	82·1	-2·1	83·1	-1·4
April	84·5	+3·5	84·4	+2·4	85·2	+1·0	84·1	-0·4
May	87·0	+6·0	86·6	+4·6	87·1	+2·9	85·7	+1·2
June	85·3	+4·3	85·9	+3·9	87·4	+3·2	86·9	+2·4
July	82·9	+1·9	83·7	+1·7	86·1	+1·9	86·5	+2·0
August	80·7	-0·3	82·1	+0·1	84·7	+0·5	85·4	+0·9
September	81·1	+0·1	81·9	-0·1	83·9	-0·3	84·7	+0·2
October	80·9	-0·1	82·1	+0·1	84·2	0·0	84·2	-0·3
November	78·8	-2·2	80·4	-1·6	83·9	-0·3	83·3	-1·2
December	77·6	-3·4	79·4	-2·6	82·9	-1·3	83·6	-0·9

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to March, and October to December	78·4	79·9	82·7	83·4
Do. of April to September	83·6	84·1	85·7	85·5
Do. of Year...	81·0	82·0	84·2	84·5
Greatest monthly mean (that of May)	87·0	86·6	......	......
Do. do. (that of June)	......	......	87·4	86·9
Least monthly mean (that of January)	77·2	......	......	......
Do. do. (that of February)	......	78·4	81·3	82·9
Differences	9·8	8·2	6·1	4·0

Temperature of the Ground, 1865.

TABLE VI.—*Showing, for each hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine Inches respectively below the surface, and its Mean Diurnal Variation for the year.*

Bombay Civil Time.	DEPTH.			
	1 Inch.		9 Inches.	
	Mean Temperature.	Excess over the mean of 24 hours.	Mean Temperature.	Excess over the Mean of 24 hours.
	°	°	°	°
Midnight.	79·6	− 1·4	82·0	0·0
1 A.M.	79·4	− 1·6	82·0	0·0
2 „	79·1	− 1·9	81·9	− 0·1
3 „	78·8	− 2·2	81·9	− 0·1
4 „	78·5	− 2·5	81·8	− 0·2
5 „	78·3	− 2·7	81·7	− 0·3
6 „	78·1	− 2·9	81·7	− 0·3
7 „	78·6	− 2·4	81·6	− 0·4
8 „	79·6	− 1·4	81·6	− 0·4
9 „	80·6	− 0·4	81·6	− 0·4
10 „	81·5	+ 0·5	81·7	− 0·3
11 „	82·4	+ 1·4	81·8	− 0·2
Noon.	83·3	+ 2·3	81·9	− 0·1
1 P.M.	84·0	+ 3·0	82·0	0·0
2 „	84·4	+ 3·4	82·1	+ 0·1
3 „	84·5	+ 3·5	82·2	+ 0·2
4 „	84·3	+ 3·3	82·3	+ 0·3
5 „	83·4	+ 2·4	82·3	+ 0·3
6 „	82·3	+ 1·3	82·4	+ 0·4
7 „	81·6	+ 0·6	82·3	+ 0·3
8 „	81·2	+ 0·2	82·3	+ 0·3
9 „	80·7	− 0·3	82·2	+ 0·2
10 „	80·3	− 0·7	82·2	+ 0·2
11 „	79·9	− 1·1	82·1	+ 0·1

	DEPTH.	
	1 Inch.	9 Inches.
	°	°
Mean of hours from 10 P.M. to 9 A.M.	79·2	......
Ditto 10 A.M. to 9 P.M.	82·8	......
Ditto 1 A.M. to Noon	......	81·8
Ditto 1 P.M. to Midnight	......	82·2
Mean of 24 hours	81·0	82·0
Maximum at 3 P.M.	84·5	......
Ditto 6 P.M.	......	82·4
Minimum at 6 A.M.	78·1	......
Ditto 8 A.M.	......	81·6
Differences	6·4	0·8

Temperature of Evaporation, 1865.

TABLE VII.—*Mean Temperature of Evaporation for each day of Bombay Civil Time; also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	68·6	72·2	72·4	79·4	81·0	79·0	78·7	78·4	...	74·1	74·8
2	...	65·8	72·0	...	79·3	81·0	...	78·5	78·2	75·3	75·8	73·3
3	67·5	68·6	70·6	75·0	79·0	80·4	80·1	77·2	...	75·0	74·8	...
4	69·3	70·0	72·6	75·3	78·7	...	79·1	77·1	77·7	73·8	74·4	75·5
5	68·8	...	...	76·0	77·7	79·8	79·3	77·0	77·2	73·7	...	75·6
6	69·0	72·1	69·2	76·3	79·6	81·0	78·4	78·1	77·5	74·4	73·2	74·4
7	68·8	71·7	70·0	77·8	...	80·2	78·6	...	76·7	75·8	70·6	73·9
8	...	69·4	70·1	79·1	79·8	79·2	77·9	78·9	76·3	...	72·6	73·7
9	67·1	67·8	70·1	...	80·0	79·0	...	78·9	76·1	76·9	69·9	70·0
10	68·5	66·6	70·3	80·1	79·4	79·0	79·1	78·8	...	75·9	69·1	...
11	67·1	64·9	...	79·5	79·4	...	79·1	79·2	77·3	76·2	69·6	66·7
12	67·5	...	...	80·6	78·7	79·7	78·6	80·0	76·9	76·9	...	66·8
13	68·8	65·1	66·6	79·8	77·9	79·5	78·8	...	77·2	77·0	69·1	66·4
14	68·8	65·8	66·8	79·3	...	79·9	79·2	76·8	76·7	76·8	70·2	65·4
15	...	68·5	71·7	...	79·3	79·8	78·8	76·3	76·8	...	71·0	67·0
16	67·6	70·5	72·2	...	79·6	80·9	...	75·9	76·8	76·3	68·7	69·8
17	67·3	69·1	72·1	78·9	79·8	80·4	78·7	75·8	...	78·3	70·0	...
18	68·0	68·7	72·6	78·0	80·6	...	78·8	76·9	75·7	78·1	71·6	71·0
19	70·0	...	...	78·8	80·3	80·7	78·7	77·6	75·9	77·4	...	69·4
20	71·7	70·1	72·3	79·3	80·1	80·2	79·1	...	75·7	74·7	72·4	71·4
21	73·2	70·4	71·4	79·6	...	79·9	79·4	76·8	75·3	...	69·4	71·2
22	...	69·6	75·0	80·2	80·3	77·0	78·7	77·3	74·5	...	67·6	69·6
23	71·8	70·0	75·4	...	80·2	78·5	...	77·5	76·0	75·9	71·8	68·2
24	71·1	...	75·2	79·7	...	79·0	78·9	77·1	...	76·7	73·7	...
25	70·8	69·0	74·4	79·4	80·0	...	78·8	78·1	76·3	77·7	68·9	69·4
26	69·9	65·6	...	79·6	79·9	79·3	76·7	78·0	75·8	77·8	...	...
27	69·0	...	73·3	79·0	80·1	80·2	78·4	77·8	76·3	77·6	65·6	65·8
28	69·1	70·7	74·0	79·1	80·4	79·8	78·1	...	75·3	76·3	68·1	63·6
29	...		72·9	79·1	...	78·8	77·5	77·1	75·0	...	73·5	65·5
30	72·0		74·1	...	81·3	78·0	...	76·8	74·8	74·1	75·1	67·3
31	70·9		73·0		81·5		78·6	77·3		73·8		...
Monthly Means.	69·3	68·6	71·9	78·4	79·7	79·7	78·7	77·6	76·4	76·1	71·2	69·8
Annual Variation.	−5·5	−6·2	−2·9	+3·6	+4·9	+4·9	+3·9	+2·8	+1·6	+1·3	−3·6	−5·0

Mean of months from January to March and October to December	° 71·1
Mean of months from April to September	78·4
Mean for the year	74·8
The greatest monthly mean (that of May or June)	79·7
The least monthly mean (that of February)	68·6
Difference	11·1

Temperature of Evaporation, 1865.

TABLE VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year : or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	+ 0·1	− 1·1	− 1·1	− 1·2	− 1·3	− 0·6	− 0·9	− 1·0	− 0·9	− 0·7	− 1·5	− 1·0	− 0·9
1 A.M.	− 0·8	− 0·9	− 1·3	− 1·0	− 1·1	− 0·2	− 0·9	− 0·9	− 1·3	− 0·9	− 1·6	− 1·7	− 1·0
2 „	− 1·4	− 1·1	− 1·5	− 1·3	− 1·3	− 1·4	− 0·8	− 1·0	− 1·6	− 0·9	− 1·8	− 2·2	− 1·4
3 „	− 1·8	− 1·3	− 1·9	− 1·4	− 1·5	− 1·4	− 0·7	− 1·0	− 1·7	− 1·2	− 2·0	− 2·3	− 1·5
4 „	− 2·2	− 1·4	− 2·4	− 1·5	− 1·5	− 1·2	− 0·8	− 1·1	− 1·9	− 1·3	− 2·3	− 3·1	− 1·7
5 „	− 2·4	− 1·9	− 2·2	− 1·8	− 1·6	− 1·1	− 1·1	− 0·9	− 1·6	− 1·9	− 2·1	− 3·2	− 1·8
6 „	− 2·6	− 2·3	− 2·3	− 1·6	− 1·1	− 1·2	− 0·7	− 0·8	− 1·3	− 1·6	− 2·2	− 3·4	− 1·8
7 „	− 2·6	− 2·2	− 1·9	− 0·6	− 0·5	− 1·0	− 0·3	− 0·2	− 0·8	− 0·8	− 1·8	− 3·2	− 1·3
8 „	− 1·9	− 1·4	− 1·2	+ 0·3	0·0	− 0·7	+ 0·3	0·0	− 0·5	+ 0·1	− 1·2	− 2·4	− 0·7
9 „	− 1·2	− 0·5	− 0·1	+ 0·4	+ 0·5	+ 0·3	+ 0·5	+ 0·8	+ 0·8	+ 0·2	− 0·6	− 1·0	0·0
10 „	− 0·6	+ 0·2	+ 0·5	+ 0·9	+ 0·9	+ 0·7	+ 0·8	+ 1·1	+ 1·0	+ 0·5	− 0·3	− 0·3	+ 0·4
11 „	− 0·2	+ 1·0	+ 1·0	+ 1·4	+ 1·3	+ 0·8	+ 1·2	+ 1·3	+ 1·5	+ 0·9	+ 0·2	+ 0·3	+ 0·9
Noon.	+ 0·4	+ 1·7	+ 1·5	+ 1·8	+ 1·5	+ 1·1	+ 1·6	+ 1·8	+ 1·8	+ 1·4	+ 1·0	+ 1·0	+ 1·4
1 P.M.	+ 1·1	+ 2·2	+ 2·5	+ 1·9	+ 1·7	+ 1·7	+ 1·4	+ 1·6	+ 2·0	+ 1·4	+ 1·5	+ 2·3	+ 1·8
2 „	+ 1·4	+ 2·6	+ 2·6	+ 2·0	+ 2·0	+ 1·7	+ 1·6	+ 1·4	+ 1·8	+ 1·9	+ 1·9	+ 3·2	+ 2·0
3 „	+ 2·3	+ 2·6	+ 2·6	+ 1·6	+ 2·0	+ 1·6	+ 1·4	+ 1·1	+ 1·7	+ 1·8	+ 2·4	+ 3·4	+ 2·0
4 „	+ 2·6	+ 2·7	+ 1·8	+ 1·2	+ 1·9	+ 1·2	+ 0·9	+ 0·9	+ 1·2	+ 1·6	+ 2·5	+ 3·2	+ 1·8
5 „	+ 2·3	+ 2·0	+ 1·8	+ 1·3	+ 1·0	+ 1·3	+ 0·3	+ 0·4	+ 1·1	+ 0·9	+ 2·2	+ 3·0	+ 1·5
6 „	+ 1·8	+ 0·6	+ 1·1	+ 0·4	+ 0·3	+ 1·0	+ 0·1	− 0·2	+ 0·5	+ 0·2	+ 1·9	+ 2·6	+ 0·7
7 „	+ 1·7	+ 0·4	+ 0·8	− 0·2	− 0·2	+ 0·1	− 0·5	− 0·4	+ 0·2	0·0	+ 1·9	+ 2·5	+ 0·5
8 „	+ 1·6	+ 0·2	+ 0·6	− 0·4	− 0·3	− 0·1	− 0·7	− 0·5	0·0	− 0·2	+ 1·8	+ 2·6	+ 0·4
9 „	+ 1·4	− 0·1	0·0	− 0·5	− 0·7	− 0·6	− 0·7	− 0·7	− 0·5	− 0·4	+ 0·9	+ 1·0	− 0·1
10 „	+ 0·7	− 0·6	− 0·5	− 0·7	− 1·0	− 0·5	− 0·9	− 0·6	− 0·8	− 0·4	0·0	− 0·2	− 0·5
11 „	+ 0·3	− 1·2	− 0·8	− 1·0	− 1·1	− 0·6	− 0·9	− 0·8	− 0·9	− 0·7	− 0·9	− 0·9	− 0·8

	°
Mean of the hours from 10 P.M. to 9 A.M.	73·7
Mean of the hours from 10 A.M. to 9 P.M.	75·9
Mean for 24 hours	74·8

In the Mean Diurnal Variation for the year a Maximum occurs between 2 and 3 P.M. and a Minimum between 5 and 6 A.M.

Temperature of Dew-point, 1865.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time; also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	65·0	69·7	69·1	76·5	78·2	77·6	76·6	77·2	...	73·0	73·2
2	...	60·0	69·3	...	76·4	78·2	...	76·5	76·9	73·3	74·0	70·9
3	62·7	65·1	66·9	72·4	76·2	77·6	78·9	75·9	...	73·3	73·2	...
4	64·9	66·0	69·4	72·8	75·5	...	78·2	76·2	76·1	72·4	72·7	73·6
5	64·3	...	...	73·8	74·1	77·4	78·1	75·7	75·2	72·5	...	73·6
6	65·0	68·7	64·9	73·9	76·6	78·9	77·5	76·9	75·9	72·6	69·1	71·9
7	65·3	68·8	65·9	75·8	...	77·9	77·5	...	75·3	74·0	65·7	70·9
8	...	65·8	66·2	77·3	76·8	77·4	77·1	77·6	74·6	...	69·7	70·8
9	61·9	62·3	66·1	...	77·0	77·7	...	77·5	74·4	75·2	65·5	65·5
10	63·8	61·8	65·8	78·0	76·2	77·8	77·7	77·8	...	74·1	64·4	...
11	62·3	59·2	...	76·8	76·2	...	77·6	78·1	75·2	74·4	65·0	61·6
12	63·5	...	...	78·8	75·5	78·2	77·0	78·9	74·8	74·9	...	62·2
13	64·0	58·9	60·7	77·6	74·5	78·1	77·1	...	75·5	75·0	65·1	61·3
14	64·3	59·6	61·1	77·0	...	78·4	77·4	76·2	74·9	74·8	67·0	60·0
15	...	64·4	68·4	...	76·4	78·3	76·9	75·8	75·3	...	67·4	62·2
16	63·1	66·7	69·0	...	77·1	78·9	...	75·5	75·2	74·2	63·4	66·0
17	62·3	65·5	69·3	76·5	77·7	78·1	77·2	75·4	...	76·3	65·2	...
18	62·6	64·9	69·7	75·2	78·5	...	77·0	76·4	74·0	76·0	67·2	68·1
19	65·2	...	...	76·4	78·0	78·3	76·8	77·0	74·2	74·9	...	65·9
20	68·1	66·1	68·0	76·9	77·4	77·6	77·2	...	73·3	71·2	69·2	68·5
21	70·6	66·5	66·2	77·3	...	77·5	77·6	76·2	72·9	...	65·4	68·3
22	...	64·7	72·4	77·4	77·7	74·3	76·7	76·8	72·3	...	63·3	66·1
23	68·5	66·0	73·3	...	77·4	76·1	...	77·0	74·2	73·2	69·1	64·2
24	67·1	..	72·3	77·2	...	76·6	76·9	76·6	...	74·5	70·8	...
25	66·7	64·4	71·3	76·9	77·1	...	76·7	77·0	74·4	75·6	63·7	...
26	65·9	60·2	...	77·0	76·8	77·0	76·0	76·9	73·5	76·2	...	66·2
27	65·3	...	70·0	76·1	77·1	78·1	76·9	76·6	74·3	75·8	58·6	61·5
28	65·6	66·8	71·0	76·3	77·5	77·4	76·8	...	72·6	74·3	62·6	57·5
29	...		68·3	76·2	...	77·3	75·9	76·1	72·3	...	70·5	59·5
30	68·8		71·0	...	78·4	76·9	...	75·8	72·0	72·9	73·4	63·3
31	69·0		69·9		78·8		76·5	76·3		72·4		...
Monthly Means.	65·2	64·2	68·3	75·9	76·8	77·6	77·2	76·6	74·5	74·2	67·5	66·1
Annual Variation.	− 6·8	− 7·8	− 3·7	+ 3·9	+ 4·8	+ 5·6	+ 5·2	+ 4·6	+ 2·5	+ 2·2	− 4·5	− 5·9

	°
Mean of months from January to March and October to December	67·6
Mean of months from April to September	76·4
Mean of the year	72·0
The greatest monthly mean (that of June)	77·6
The least monthly mean (that of February)	64·2
Difference	13·4

Temperature of Dew-point, 1865.

TABLE X.—*The Mean Diurnal Variation of the Temperature of Dew-point for each Month, and for the whole Year: or the Excess of the Mean Temperature of the Dew-point above the respective Monthly and Annual Means.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	+ 2·1	0·0	0·0	− 1·0	− 0·7	0·0	− 0·8	− 0·8	− 0·4	− 0·2	− 0·6	+ 0·3	− 0·2
1 A.M.	+ 0·7	+ 0·1	− 0·2	− 0·9	− 0·4	− 0·7	− 0·7	− 0·7	− 0·8	− 0·2	− 0·5	− 1·0	− 0·4
2 „	0·0	+ 0·4	− 0·4	− 0·3	− 0·5	− 0·9	− 0·4	− 0·8	− 1·1	− 0·1	− 0·8	− 1·9	− 0·6
3 „	− 0·5	+ 0·3	− 0·8	− 0·4	− 0·7	− 0·9	− 0·3	− 0·7	− 1·2	− 0·4	− 1·0	− 1·5	− 0·7
4 „	− 1·0	+ 0·3	− 1·5	− 0·5	− 0·8	− 0·7	− 0·4	− 0·8	− 1·4	− 0·4	− 1·4	− 2·5	− 0·9
5 „	− 1·8	− 0·2	− 1·0	− 0·6	− 0·7	− 0·5	− 0·8	− 0·7	− 1·0	− 1·2	− 1·0	− 2·5	− 1·0
6 „	− 1·4	− 0·9	− 1·4	− 0·4	− 0·2	− 0·5	− 0·3	− 0·5	− 0·6	− 0·6	− 1·0	− 2·5	− 0·9
7 „	− 1·4	− 1·2	− 1·1	+ 0·2	− 0·1	− 0·7	+ 0·2	+ 0·2	− 0·4	+ 0·1	− 0·7	− 2·8	− 0·6
8 „	− 1·5	− 1·2	− 1·4	+ 0·7	− 0·1	− 0·8	+ 0·6	+ 0·2	− 0·4	+ 0·6	− 0·8	− 2·7	− 0·6
9 „	− 1·5	− 0·8	− 0·6	+ 0·2	+ 0·2	+ 0·2	+ 0·6	+ 1·0	+ 0·9	+ 0·3	− 0·7	− 1·8	− 0·2
10 „	− 1·5	− 0·5	− 0·5	+ 0·4	+ 0·2	+ 0·3	+ 0·6	+ 1·1	+ 0·9	+ 0·2	− 1·2	− 1·5	− 0·1
11 „	− 1·7	− 0·6	− 0·4	+ 0·7	+ 0·4	+ 0·2	+ 0·8	+ 1·2	+ 1·0	+ 0·3	− 1·3	− 1·6	− 0·1
Noon.	− 2·1	+ 0·9	− 0·1	+ 0·8	+ 0·4	+ 0·5	+ 1·1	+ 1·7	+ 1·1	+ 0·5	− 0·6	− 1·3	+ 0·2
1 P.M.	− 2·3	+ 0·3	+ 1·1	+ 0·7	+ 0·5	+ 0·6	+ 1·9	+ 1·2	+ 1·2	0·0	− 1·0	+ 0·5	+ 0·4
2 „	− 2·2	+ 0·7	+ 1·2	+ 0·5	+ 0·8	+ 0·9	+ 0·9	+ 1·0	+ 0·9	+ 0·4	− 0·8	+ 1·7	+ 0·5
3 „	− 0·6	+ 0·6	+ 1·2	+ 0·1	+ 0·9	+ 0·7	+ 0·8	+ 0·8	+ 0·7	+ 0·3	− 0·2	+ 2·3	+ 0·7
4 „	+ 0·5	+ 0·9	+ 0·2	− 0·2	+ 1·1	+ 0·3	+ 0·4	+ 0·6	0·0	+ 0·2	+ 0·3	+ 2·3	+ 0·5
5 „	+ 1·7	+ 0·6	+ 0·7	+ 0·6	+ 0·4	+ 0·8	0·0	+ 0·1	+ 0·3	− 0·2	+ 1·7	+ 3·3	+ 0·8
6 „	+ 2·2	+ 0·1	+ 1·3	+ 0·4	+ 0·4	+ 1·0	0·0	− 0·3	+ 0·5	− 0·1	+ 2·2	+ 3·7	+ 0·9
7 „	+ 2·4	+ 0·5	+ 1·3	+ 0·1	+ 0·3	+ 0·4	− 0·5	− 0·4	+ 0·3	0·0	+ 2·7	+ 3·6	+ 1·0
8 „	+ 2·7	+ 0·6	+ 1·4	0·0	+ 0·3	+ 0·3	− 0·6	− 0·3	+ 0·4	− 0·1	+ 2·8	+ 3·5	+ 1·0
9 „	+ 2·7	+ 0·7	+ 0·7	+ 0·1	− 0·1	− 0·2	− 0·6	− 0·7	− 0·2	− 0·1	+ 2·3	+ 2·4	+ 0·7
10 „	+ 2·3	+ 0·3	+ 0·3	0·0	− 0·4	− 0·1	− 0·8	− 0·6	− 0·6	0·0	+ 1·2	+ 0·8	+ 0·3
11 „	+ 2·1	− 0·3	+ 0·1	− 0·4	− 0·6	− 0·2	− 0·8	−0· 6	− 0·5	− 0·2	+ 0·2	0·0	0·0

	°
Mean of the hours from Midnight to 11 A.M.	71·5
Mean of the hours from Noon to 11 P.M.	72·6
Mean for 24 hours	72·0

In the Mean Diurnal Variation for the Year a Maximum occurs between 7 and 8 P.M. and a Minimum at 5 A.M.

Maxima and Minima of different Meteorological Elements, 1865.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1865, *which showed the greatest and the least values of the following elements, viz., of Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1865. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	°	°	°	°	°	°	°	°	°
January	30·109	29·834	0·275	89·6	68·0	21·6	77·8	60·0	17·8	74·4	52·9	21·5
February	·057	·805	·252	87·8	69·0	18·8	75·0	58·0	17·0	71·8	48·3	23·5
March	29·992	·743	·249	89·8	70·0	19·8	78·0	62·0	16·0	75·4	54·1	21·3
April	·973	·630	·343	93·0	73·4	19·6	83·2	70·0	13·2	81·3	67·1	14·2
May	·878	·546	·332	96·0	81·7	14·3	84·0	74·0	10·0	81·1	69·3	11·8
June...........	·816	·543	·273	95·4	77·7	17·7	84·2	74·0	10·2	83·2	70·5	12·7
July...........	·840	·456	·384	90·0	77·0	13·0	82·5	75·0	7·5	80·6	73·7	6·9
August.........	·775	·516	·259	89·6	75·0	14·6	82·0	74·0	8·0	80·6	73·2	7·4
September ...	·983	·652	·331	88·0	73·0	15·0	81·0	69·0	12·0	79·5	63·2	16·3
October	·970	·706	·264	91·8	71·6	20·2	81·0	69·0	12·0	79·3	65·8	13·5
November ...	30·043	·681	·362	91·4	69·0	22·4	80·5	61·0	19·5	78·0	50·5	27·5
December ...	·081	·813	·268	87·7	66·1	21·6	79·0	58·0	21·0	76·6	50·9	25·7
Year...........	30·109	29·456	0·653	96·0	66·1	29·9	84·2	58·0	26·2	83·2	48·3	34·9

Pressure of Vapour, 1865.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time, also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1865. Date.	MONTHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·620	0·721	0·706	0·895	0·945	0·930	0·898	0·917	...	0·800	0·808
2	...	·531	·710	...	·890	·946	...	·897	·907	0·810	·836	·750
3	0·575	·621	·655	·784	·887	·927	·968	·881	...	·809	·812	...
4	·618	·638	·715	·797	·867	...	·947	·889	·885	·786	·794	·817
5	·605	...	...	·821	·829	·923	·942	·873	·862	·787	...	·819
6	·618	·698	·617	·825	·901	·969	·926	·909	·877	·791	·707	·777
7	·624	·700	·639	·878	...	·940	·925	...	·863	·827	·634	·753
8	...	·635	·642	·918	·905	·922	·914	·929	·842	...	·720	·748
9	·562	·565	·640	...	·911	·931	...	·926	·840	·859	·628	·629
10	·598	·559	·638	·941	·888	·936	·932	·933	...	·831	·610	...
11	·568	·509	...	·913	·884	...	·927	·943	·859	·838	·619	·561
12	·583	...	...	·966	·868	·952	·910	·969	·849	·853	...	·566
13	·600	·508	·536	·930	·842	·943	·914	...	·869	·864	·621	·547
14	·606	·522	·548	·911	...	·954	·921	·888	·853	·848	·661	·528
15	...	·608	·691	...	·893	·948	·908	·876	·864	...	·672	·573
16	·582	·665	·705	...	·913	·969	...	·867	·859	·832	·587	·650
17	·570	·628	·712	·896	·930	·946	·917	·865	...	·892	·627	...
18	·573	·618	·721	·860	·956	...	·911	·892	·830	·884	·667	·685
19	·625	...	...	·893	·942	·950	·905	·910	·834	·851	...	·637
20	·685	·637	·688	·907	·924	·928	·918	...	·809	·756	·711	·696
21	·741	·650	·653	·919	...	·926	·929	·889	·801	...	·628	·689
22	...	·614	·787	·935	·932	·837	·903	·904	·787	...	·587	·642
23	·693	·639	·808	...	·922	·886	...	·911	·833	·809	·711	·602
24	·662	...	·786	·914	...	·900	·909	·899	...	·842	·748	...
25	·655	·607	·759	·909	·917	...	·902	·911	·838	·872	·595	...
26	·637	·524	...	·912	·905	·912	·881	·908	·814	·887	...	·646
27	·623	...	·730	·885	·913	·942	·909	·900	·836	·881	·508	·552
28	·631	·657	·753	·891	·924	·921	·906	...	·791	·836	·572	·488
29	...		·699	·889	...	·919	·879	·886	·783	...	·744	·526
30	·700		·751	...	·955	·909	...	·877	·776	·797	·810	·592
31	·704		·725		·963		·896	·891		·785		...
Monthly Means.	0·625	0·607	0·693	0·883	0·906	0·930	0·917	0·901	0·841	0·833	0·677	0·651
Annual Variation.	−0·164	−0·182	−0·096	+0·094	+0·117	+0·141	+0·128	+0·112	+0·052	+0·044	−0·112	−0·138

	in.
Mean of months from January to March and October to December	0·681
Mean of months from April to September..	0·896
Mean for the year	0·789
The greatest monthly mean (that of June)	0·930
The least monthly mean (that of February)	0·607
Difference............	0·323

Pressure of Vapour, 1865.

Table XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·041	−0·001	−0·002	−0·016	−0·021	−0·002	−0·022	−0·025	−0·007	−0·005	−0·009	−0·004	−0·006
1 A.M.	+ ·014	+ ·002	− ·007	− ·005	− ·012	− ·023	− ·020	− ·023	− ·022	− ·006	− ·013	− ·012	− ·011
2 „	− ·001	+ ·006	− ·010	− ·010	− ·015	− ·029	− ·012	− ·025	− ·029	− ·003	− ·018	− ·032	− ·015
3 „	− ·010	+ ·005	− ·019	− ·012	− ·021	− ·027	− ·008	− ·022	− ·031	− ·011	− ·023	− ·032	− ·018
4 „	− ·020	+ ·005	− ·032	− ·015	− ·021	− ·021	− ·011	− ·028	− ·036	− ·011	− ·030	− ·051	− ·023
5 „	− ·020	− ·006	− ·022	− ·019	− ·020	− ·015	− ·024	− ·020	− ·024	− ·031	− ·022	− ·051	− ·023
6 „	− ·027	− ·018	− ·020	− ·012	− ·005	− ·016	− ·008	− ·014	− ·015	− ·015	− ·022	− ·052	− ·019
7 „	− ·029	− ·022	− ·023	+ ·003	− ·004	− ·021	− ·005	+ ·003	− ·008	+ ·005	− ·015	− ·056	− ·014
8 „	− ·031	− ·020	− ·029	+ ·014	− ·003	− ·024	+ ·016	+ ·004	− ·009	+ ·019	− ·018	− ·055	− ·011
9 „	− ·031	− ·015	− ·013	+ ·002	+ ·004	+ ·004	+ ·016	+ ·026	+ ·025	+ ·015	− ·014	− ·037	− ·001
10 „	− ·031	− ·010	− ·011	+ ·010	+ ·006	+ ·008	+ ·017	+ ·032	+ ·024	+ ·010	− ·022	− ·033	·000
11 „	− ·035	− ·005	− ·008	+ ·018	+ ·012	+ ·008	+ ·024	+ ·033	+ ·029	+ ·008	− ·024	− ·033	+ ·002
Noon.	− ·042	·000	− ·002	+ ·022	+ ·011	+ ·014	+ ·032	+ ·047	+ ·030	+ ·015	− ·018	− ·028	+ ·007
1 P.M.	− ·046	+ ·008	+ ·025	+ ·017	+ ·014	+ ·029	+ ·025	+ ·033	+ ·034	·000	− ·016	+ ·010	+ ·011
2 „	− ·042	+ ·011	+ ·026	+ ·012	+ ·022	+ ·027	+ ·028	+ ·026	+ ·024	+ ·011	− ·013	+ ·035	+ ·014
3 „	− ·012	+ ·010	+ ·027	+ ·001	+ ·024	+ ·019	+ ·022	+ ·021	+ ·019	+ ·008	− ·001	+ ·046	+ ·015
4 „	+ ·008	+ ·018	+ ·004	− ·012	+ ·027	+ ·008	+ ·010	+ ·017	·000	+ ·006	+ ·008	+ ·046	+ ·012
5 „	+ ·033	+ ·011	+ ·014	+ ·015	+ ·012	+ ·025	+ ·003	+ ·002	+ ·008	− ·002	+ ·038	+ ·070	+ ·019
6 „	+ ·044	+ ·001	+ ·028	+ ·008	+ ·010	+ ·027	− ·001	− ·010	+ ·014	− ·002	+ ·048	+ ·077	+ ·020
7 „	+ ·049	+ ·010	+ ·029	− ·001	+ ·006	+ ·010	− ·018	− ·012	+ ·009	+ ·001	+ ·059	+ ·076	+ ·018
8 „	+ ·053	+ ·008	+ ·031	− ·004	+ ·007	+ ·006	− ·019	− ·011	+ ·009	− ·002	+ ·062	+ ·073	+ ·018
9 „	+ ·056	+ ·008	+ ·015	− ·001	− ·002	− ·008	− ·019	− ·020	− ·002	− ·002	+ ·042	+ ·043	+ ·009
10 „	+ ·047	+ ·004	+ ·006	− ·004	− ·011	− ·005	− ·024	− ·018	− ·014	+ ·002	+ ·024	+ ·013	+ ·002
11 „	+ ·041	− ·006	+ ·001	− ·014	− ·016	− ·004	− ·023	− ·019	− ·016	− ·006	+ ·003	− ·004	− ·005

	in.
Mean of the hours from 11 P.M. to 10 A.M.	0·777
Mean of the hours from 11 A.M. to 10 P.M.	0·801
Mean of 24 hours	0·789

In the Mean Diurnal Variation for the year a Maximum occurs at 6 P.M. and a Minimum between 4 and 5 A.M.

Pressure of Vapour, 18

the

TABLE XII.—*Mean Pressure of Vapour for each Day of*
Monthly Pressure of Vapour and its Variation fr

1865. Date.	MONTHS.											
	January.	February.	March.	April.	May.	June.						
	in.	in.	in.	in.	in.	in.						
1	...	0·620	0·721	0·706	0·895	0·94						
2	...	·531	·710	...	·890	·9						
3	0·575	·621	·655	·784	·887	·						
4	·618	·638	·715	·797	·867							
5	·605	...	...	·821	·829							
6	·618	·698	·617	·825	·901							
7	·624	·700	·639	·878	...							
8	...	·635	·642	·918	·905							
9	·562	·565	·640	...	·91							
10	·598	·559	·638	·941	·8							
11	·568	·509	...	·913	·							
12	·583	...	...	·966								
13	·600	·508	·536	·930								
14	·606	·522	·548	·911								
15	...	·608	·691	...								
16	·582	·665	·705	...								
17	·570	·628	·712	·89								
18	·573	·618	·721	·8								·76
19	·625	...	...	·8								·72
20	·685	·637	·688	·							73	·76
21	·741	·650	·653								·69	·76
22	...	·614	·787								·67	·72
23	·693	·639	·808							75	·77	·69
24	·662	...	·786							·79	·75	...
25	·655	·607	·75						·	·79	·64	...
26	·637	·524	...						78	·83	...	·74
27	·623	...	·7						·80	·82	·56	·69
28	·631	·657	·						·75	·81	·60	·60
29	...							9	·75	...	·75	·62
30	·700							·89	·74	·87	·82	·71
31	·704							·89		·85		...
Monthly Means.	0·625	0·607					0·84	0·89	0·81	0·81	0·71	0·71
Annual Variation.	−0·164	−0·1				3	+0·08	+0·13	+0·05	+0·05	−0·05	−0·05

Mean of mo . November and December ...... 0·71
Mean of n .... 0·81

M .... 0·76

he gr . August) .... 0·89
e lo l'ebruary) .... 0·67

Difference............ 0·22

Relative Humidity of the Air, 1865.

Mean Diurnal Variation of Relative Humidity of the Air for each Month, hole Year; or the Excess of the Mean Relative Humidity above the and Annual Means.

	MONTHS.												Year.
					v.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
					+ 0·05	+ 0·04	+ 0·02	+ 0·02	+ 0·05	+ 0·05	+ 0·07	+ 0·06	+ 0·05
					+ ·06	+ ·04	+ ·03	+ ·02	+ ·04	+ ·07	+ ·07	+ ·06	+ ·06
				08	+ ·06	+ ·04	+ ·04	+ ·02	+ ·05	+ ·08	+ ·07	+ ·06	+ ·06
				·09	+ ·06	+ ·04	+ ·04	+ ·03	+ ·05	+ ·08	+ ·07	+ ·06	+ ·06
				+ ·09	+ ·07	+ ·05	+ ·04	+ ·02	+ ·05	+ ·08	+ ·07	+ ·05	+ ·06
				+ ·10	+ ·07	+ ·06	+ ·04	+ ·03	+ ·06	+ ·07	+ ·08	+ ·06	+ ·07
			7	+ ·11	+ ·08	+ ·06	+ ·05	+ ·04	+ ·07	+ ·10	+ ·09	+ ·07	+ ·08
			·06	+ ·06	+ ·03	+ ·02	+ ·05	+ ·04	+ ·05	+ ·09	+ ·08	+ ·05	+ ·06
			- ·01	+ ·01	− ·01	− ·01	+ ·03	+ ·02	+ ·01	+ ·06	+ ·02	− ·01	+ ·01
			− ·04	− ·04	− ·04	− ·01	·00	+ ·02	+ ·01	+ ·03	− ·01	− ·05	− ·01
		5	− ·07	− ·05	− ·07	− ·04	− ·02	·00	− ·02	− ·02	− ·05	− ·07	− ·04
		·07	− ·10	− ·07	− ·08	− ·06	− ·04	− ·01	− ·04	− ·05	− ·09	− ·11	− ·07
		- ·10	− ·12	− ·09	− ·10	− ·06	− ·05	− ·01	− ·07	− ·08	− ·11	− ·14	− ·09
		− ·12	− ·10	− ·12	− ·11	− ·07	− ·06	− ·04	− ·07	− ·11	− ·14	− ·12	− ·10
	20	− ·13	− ·11	− ·13	− ·11	− ·08	− ·06	− ·04	− ·08	− ·12	− ·16	− ·10	− ·11
	·17	− ·13	− ·11	− ·13	− ·10	− ·09	− ·06	− ·03	− ·09	− ·13	− ·16	− ·09	− ·11
	− ·14	− ·12	− ·12	− ·12	− ·09	− ·08	− ·05	− ·03	− ·10	− ·11	− ·15	− ·08	− ·10
	− ·06	− ·10	− ·09	− ·07	− ·06	− ·05	− ·03	− ·03	− ·07	− ·09	− ·05	+ ·01	− ·06
	− ·02	− ·04	− ·01	− ·01	·00	+ ·01	− ·01	·00	·00	− ·03	·00	+ ·05	·00
,,	+ ·03	·00	+ ·02	+ ·02	+ ·03	+ ·02	− ·01	·00	+ ·02	·00	+ ·04	+ ·07	+ ·02
,,	+ ·05	+ ·02	+ ·04	+ ·03	+ ·04	+ ·03	+ ·01	+ ·02	+ ·03	+ ·01	+ ·06	+ ·08	+ ·03
9 ,,	+ ·07	+ ·05	+ ·04	+ ·04	+ ·05	+ ·03	+ ·01	·00	+ ·03	+ ·03	+ ·06	+ ·08	+ ·04
10 ,,	+ ·09	+ ·05	+ ·05	+ ·05	+ ·04	+ ·04	+ ·01	+ ·01	+ ·02	+ ·04	+ ·07	+ ·07	+ ·04
11 ,,	+ ·10	+ ·06	+ ·06	+ ·04	+ ·05	+ ·04	+ ·02	+ ·02	+ ·03	+ ·04	+ ·07	+ ·06	+ ·05

Mean of the hours from 8 A.M. to 7 P.M.	0·71
Mean of the hours from 8 P.M. to 7 A.M.	0·81
Mean of 24 hours.	0·76

In the Mean Diurnal Variation for the Year a Maximum occurs at 6 A.M., and a Minimum between 2 and 3 P.M.

Extent of Cloudy Sky, 1865.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time; also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	6·0	1·3	3·7	5·8	5·5	8·0	7·7	7·7	...	6·3	2·3
2	...	5·7	3·4	...	5·9	7·8	...	7·4	7·6	6·6	4·3	3·3
3		4·1	6·7	1·0	4·5	7·8	7·7	8·0	...	6·9	3·5	...
4		4·9	5·8	4·3	4·3	...	8·0	7·9	6·8	8·0	1·1	2·8
5		...	...	0·8	5·0	8·0	8·0	7·7	7·4	7·3	...	0·8
6		4·6	1·0	0·9	5·5	6·8	8·0	8·0	7·3	7·3	2·0	1·0
7		3·7	1·2	2·0	...	7·1	8·0	...	7·1	7·2	2·8	4·7
8	...	2·8	2·3	1·5	5·2	7·6	8·0	7·7	7·5	...	0·6	4·6
9	0·4	3·3	4·4	...	5·7	7·6	...	7·5	7·2	2·9	0·6	3·5
10	0·3	4·7	4·0		5·8	7·6	8·0	8·0	...	2·7		...
11	2·7	1·6	...		4·8	...	7·8	8·0	7·4	4·3	1·5	3·3
12	0·5	...	...	1·1	3·6	8·0	7·0	7·4	7·4	4·3	...	2·4
13		1·8	0·3	3·3	3·4	7·8	7·4	...	7·7	4·5	0·5	
14		1·5		3·3	...	7·8	7·4	8·0	8·0	4·7		
15	...	0·2	1·8	...	4·5	8·0	7·4	8·0	7·7	...		
16	4·4	1·2	3·3	...	7·1	6·8	...	8·0	6·7	4·3		
17	0·1	0·7	1·3	3·0	7·3	6·6	7·8	8·0	...	1·5		...
18	1·0	1·6	1·1	2·9	7·3	...	7·9	8·0	7·5	5·9	0·6	0·2
19	3·4	...	...	3·0	6·6	5·6	7·6	8·0	7·1	1·3	...	
20	3·4		2·8	5·7	6·0	5·2	7·5	...	5·8	1·8	1·8	0·5
21	4·6		0·1	6·6	...	5·5	7·8	8·0	5·7	...	0·3	0·1
22	...	0·3	0·9	6·6	5·7	6·3	7·5	8·0	7·3	...	0·6	2·0
23	7·1	3·1	0·8	...	6·4	5·9	...	8·0	6·3	3·6	0·4	1·2
24	2·0	...	2·2	5·2	...	6·0	7·4	8·0	...	6·0	0·9	...
25	1·9	2·8	3·4	6·1	4·3	...	7·9	7·7	5·5	6·6	3·1	...
26	0·2	0·4	...	5·4	4·8	7·7	8·0	7·9	3·4	7·0	...	1·8
27	4·6	...	2·5	5·0	4·6	7·0	7·7	7·9	3·7	5·7	1·5	2·9
28	5·3		0·9	6·6	5·8	6·7	8·0	...	3·7	5·8	6·4	0·9
29	...		2·7	5·6	...	8·0	8·0	8·0	4·7	...	5·3	1·8
30	7·6		0·6	...	5·4	8·0	...	8·0	3·6	7·9	3·2	1·8
31	7·7		5·7		5·0		7·4	8·0		7·8		...
Monthly Means.	2·3	2·4	2·3	3·5	5·4	7·0	7·7	7·9	6·5	5·3	1·8	1·7
Annual Variation.	− 2·2	− 2·1	− 2·2	− 1·0	+ 0·9	+ 2·5	+ 3·2	+ 3·4	+ 2·0	+ 0·8	− 2·7	− 2·8

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December.........	2·3
Mean of the months from May to October	6·6
Mean for the year	4·5
The greatest monthly mean (that of August)	7·9
The least monthly mean (that of December)	1·7
Difference............	6·2

Extent of Cloudy Sky, 1865.

TABLE XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to 8 parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	1·9	2·0	1·5	4·0	5·2	6·8	7·0	7·9	6·8	5·3	1·1	1·4	4·2
1 A.M.	1·8	2·5	2·0	4·0	5·4	6·5	7·5	7·9	6·6	5·0	1·5	1·2	4·3
2 "	2·0	2·8	2·2	4·4	5·3	6·7	7·5	7·9	6·5	5·1	1·7	1·3	4·4
3 "	2·0	2·9	2·0	4·2	5·4	6·7	7·5	7·7	6·6	5·3	1·6	1·0	4·4
4 "	2·0	2·9	2·2	4·2	5·8	6·6	7·5	7·6	6·4	5·3	1·9	1·3	4·5
5 "	2·1	2·2	2·8	3·6	5·7	7·6	8·0	7·9	6·6	5·4	1·3	1·5	4·6
6 "	2·4	2·6	3·5	3·9	5·9	7·5	8·0	8·0	6·9	6·0	1·9	3·0	5·0
7 "	2·4	2·9	3·8	3·8	6·2	7·3	7·8	7·9	7·1	6·1	1·8	3·2	5·0
8 "	2·5	2·9	3·7	3·8	6·1	7·3	7·9	7·9	7·2	5·5	1·8	3·0	5·0
9 "	2·4	2·8	3·5	3·7	5·6	7·5	7·9	8·0	6·8	5·2	2·0	2·2	4·8
10 "	2·1	2·5	3·3	4·0	5·0	7·3	8·0	8·0	6·8	5·6	1·8	2·3	4·7
11 "	2·0	2·1	3·0	3·6	4·5	7·2	8·0	7·9	6·7	5·5	1·7	2·2	4·5
Noon.	2·2	2·3	2·4	2·7	4·9	7·0	8·0	7·9	6·5	5·3	2·0	1·9	4·4
1 P.M.	2·3	2·5	1·9	2·5	5·7	7·1	8·0	7·8	6·3	5·2	2·4	1·2	4·4
2 "	2·4	2·7	2·2	2·5	5·6	6·8	7·9	7·7	6·1	5·1	2·4	1·2	4·4
3 "	2·8	3·0	2·9	2·4	5·3	6·8	8·0	7·8	6·3	5·4	2·5	1·3	4·5
4 "	2·9	3·0	1·9	3·0	5·2	6·7	8·0	7·7	5·6	5·3	2·5	1·4	4·4
5 "	2·7	2·8	2·1	3·1	5·2	7·2	8·0	7·9	5·9	5·4	2·3	2·2	4·6
6 "	2·7	3·0	2·2	3·5	5·3	7·1	7·9	8·0	6·5	5·1	2·2	1·8	4·6
7 "	2·4	1·6	1·8	3·1	5·4	7·3	7·8	8·0	6·1	4·8	1·8	1·5	4·3
8 "	2·2	1·3	1·7	2·9	5·3	7·0	7·7	8·0	6·1	5·0	1·5	1·2	4·2
9 "	2·2	1·4	1·3	3·1	5·0	7·0	7·3	7·9	6·2	4·6	1·4	0·6	4·0
10 "	2·2	1·4	1·2	4·0	5·2	6·7	7·3	8·0	6·2	4·7	1·3	1·0	4·1
11 "	2·2	1·3	1·5	4·2	5·3	6·7	7·3	7·8	6·3	5·4	1·2	1·0	4·2

Rainfall, 1865.

Table XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day and each Month of the year.*

1865. Date.	MONTHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.					in.	in.	in.	in.	in.	in.	
1							0·02	0·11	0·30		1·14	
2							7·86	0·19		0·74		
3							0·31	1·49	0·09	0·17		
4							1·03	1·59	0·01	1·24		
5						0·05	0·12	0·64	0·05	1·37		
6						0·51	0·58	1·22	0·06	1·12		
7							0·58	0·73	0·32			
8						1·57	3·39	0·40	0·02			
9						1·07	0·56	0·44	0·07	0·17		
10						1·45	0·29	0·13	0·33			
11						0·47	0·04	0·68				
12						0·47		0·02				
13						0·54	0·02	3·29	0·13			
14						0·56		4·14	0·10			
15						0·29	0·08	2·75	1·10			
16						0·02	0·27	2·11				
17						0·03	0·10	2·89	1·25			
18								2·42	0·20			
19								0·94	0·11			
20								1·64				
21						0·06	0·04	2·37				
22						0·05		1·60	0·62			
23						0·10		1·00	0·08			
24						0·18		1·25				
25								0·20	0·01			
26						0·12	1·99	0·41				
27						0·24	0·71	0·07				
28							0·03	0·11		0·24		
29						0·22	0·10	0·16	0·01	0·74		
30	0·01					2·61	0·16	0·89		0·23		
31	0·37							0·54		0·14		
Monthly Totals.	0·38					10·61	18·28	36·42	4·86	6·16	1·14	
No. of rainy days.	2					20	21	31	19	10	1	

The day is from 11 P.M. to 11 P.M.
Total fall of rain in the year .... 77·85 in.
Total number of rainy days in the year 104
The greatest fall of rain in one month (August).................. 36·42 in.

No rain fell in the months February to May, and December, nor on any of the days left blank in the above table.

Rainfall, 1865.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.					in.	in.	in.	in.	in.	in.		in.
12 to 1 A.M.	0·02					0·68	0·62	1·12	0·14	0·78			3·36
1 „ 2 „						0·54	0·91	1·16	0·34	0·21			3·16
2 „ 3 „	0·12					0·41	0·29	0·59	0·17	0·45			2·03
3 „ 4 „						0·20	0·41	0·48	0·49	0·84	0·03		2·45
4 „ 5 „	0·01					0·30	0·18	1·02	0·09	1·63	0·18		3·41
5 „ 6 „	0·17					0·43	0·34	2·00	0·01	0·22	0·14		3·31
6 „ 7 „						0·24	0·33	1·08	0·02	0·13	0·20		2·00
7 „ 8 „	0·02					0·11	0·35	1·02	0·02	0·07	0·21		1·80
8 „ 9 „						0·25	0·27	0·83	0·09	0·41	0·14		1·99
9 „ 10 „						0·25	0·14	1·56	0·10	0·23	0·15		2·43
10 „ 11 „						0·49	0·16	1·29	0·05		0·12		2·11
11 „ 12 „						0·25	0·74	1·32					2·31
12 „ 1 P.M.	0·04					0·17	0·21	1·25	0·58				2·25
1 „ 2 „						0·08	0·42	1·49	0·36	0·01			2·36
2 „ 3 „						1·08	0·31	2·22	0·02				3·63
3 „ 4 „						0·06	0·34	1·28		0·10			1·78
4 „ 5 „						0·33	0·32	1·27	0·16				2·08
5 „ 6 „						0·26	0·63	0·64	0·01	0·01			1·55
6 „ 7 „						0·54	0·25	0·86	0·03				1·68
7 „ 8 „						0·86	0·23	2·98		0·01			4·08
8 „ 9 „						0·35	0·12	1·54		0·31			2·32
9 „ 10 „	0·01					0·44	0·45	0·36	0·41	0·27			1·94
10 „ 11 „						0·11	1·10	1·39	0·95	0·40			3·95
11 to 12 „						1·67	0·29	1·88	0·41	0·09			4·34

The above table includes the Rainfall on week-days only.

Rainfall, 1865.

Table XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 26 feet above the ground, for each Day and each Month of the Year.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.					in.	in.	in.	in.	in.	in.	
1							0·02	[0·19]	0·14		1·22	
2							7·38	[0·01]		0·69		
3							0·28	[1·39]	0·07	0·17		
4						0·01	0·93	[1·49]		1·26		
5						0·04	0·12	[1·09]	0·05	1·39		
6						0·52	0·52	[0·64]	0·08	1·12		
7							0·52	[0·68]	0·33			
8						1·83	3·43	[0·68]		0·11		
9						1·58	0·27	[0·10]	0·07	0·12		
10						0·80	0·21	[0·12]	0·31			
11						0·42	0·05	[0·64]				
12						0·54		[0·02]	0·02			
13						0·36	0·01	[3·08]	0·10			
14						0·56		[4·26]	0·07			
15						0·25	0·07	[2·15]	1·04			
16						0·02	0·23	[2·00]				
17						0·02	0·09	[2·69]	1·36			
18								1·92	0·12			
19								0·76	0·08			
20								1·40				
21						0·06	0·03	2·25				
22						0·03		1·39	0·52			
23						0·10		0·86	0·06			
24						0·12		1·06				
25							0·08	0·19				
26						0·16	1·95	0·40				
27						0·12	0·77	0·05				
28							0·02	0·11		0·23		
29						0·49	0·20	0·13		0·57		
30						2·21	0·08	0·77		0·25		
31	0·35						0·08	0·60		[0·13]		
Monthly Totals.	0·35					10·24	17·34	33·12	4·42	6·04	1·22	
No. of rainy days.	1					21	23	31	16	11	1	

The numbers for the 1st to 17th August, when the instrument was undergoing alterations, and that for the 31st October bear the same proportion to the corresponding falls by Newman's Gauge as the total fall in the year by Osler's Gauge bears to the total fall in the year by Newman's Gauge.

Total fall of rain in the year	72·73 in.
Total number of rainy days in the year	104
The greatest fall in one month (August)	33·12 in.

No rain was recorded in the months of February to May, and December, nor on any of the days left blank in the above table. If the Gauge be assumed to have exposed the same extent of surface in 1865 as in May 1866 these numbers should be multiplied by 0·983: the true total fall in the year then becomes 71·49 inches.

Aggregate and Mean Pressures and Relative Frequency of Different Winds, 1865.

TABLE XXI.—*Showing, for the year* 1865, *the Sums of the Pressures of the Winds which blew, in each Month, from each of the Eight Principal Directions, with a recorded force greater than* 0·1 *lb. on the square foot; and also the Number of Observations which those sums comprise, the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.**

1865.	N.		NE.		E.		SE.		S.		SW.		W.		NW.	
Months.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.	Sums of Pressures.	Number of Observations.
	lbs.		lbs.		lbs.		lbs.		lbs.		lbs.		lbs.		lbs.	
January	15·70	107·5	14·62	78·0	8·87	44·0	6·25	18·0	0·25	1·5	3·02	8·2	7·02	32·9	62·55	258·7
February	18·15	77·0	7·20	36·0	8·95	35·5	2·00	8·5	0·30	1·5	1·55	7·0	15·30	64·0	89·30	270·5
March	36·80	123·0	2·00	9·5	2·40	10·0	1·70	9·0	6·70	13·0	4·45	19·0	20·40	74·0	125·75	361·5
April	5·05	23·5	1·35	7·0	......	......	2·45	8·0	15·35	47·0	21·55	75·0	53·00	212·0	49·75	188·0
May	2·05	7·5	......	......	......	......	2·90	3·0	1·20	4·0	45·35	128·5	89·10	200·5	62·10	172·5
June	1·75	1·5	3·75	7·0	4·45	10·0	18·05	29·5	27·05	136·0	80·80	217·5	71·35	187·0	9·40	27·5
July	0·70	2·5	0·70	2·5	0·40	1·0	6·35	14·0	26·95	50·5	159·65	292·5	91·55	228·5	9·20	27·5
August	0·65	3·0	0·75	5·0	1·25	3·5	5·65	18·5	5·75	16·0	65·90	150·5	145·10	357·0	27·25	67·5
September	0·80	2·5	3·50	17·5	0·40	1·5	2·75	11·0	18·00	69·5	26·45	101·5	59·70	219·5	64·30	184·0
October	34·60	163·0	16·95	78·0	13·00	28·5	5·30	25·5	18·30	71·5	11·90	55·0	5·50	25·0	17·95	83·5
November	74·20	288·0	27·50	96·0	15·35	57·0	5·45	16·0	4·15	12·5	1·60	5·0	3·70	19·0	27·45	97·5
December	92·35	300·5	5·20	22·5	3·35	15·0	3·80	13·5	2·20	6·5	0·80	4·0	8·05	22·5	59·25	205·5
Sums	282·80	1099·5	83·52	359·0	58·42	206·0	62·65	174·5	126·20	429·5	423·02	1063·7	569·77	1641·9	604·25	1944·2
Means	0·26		0·23		0·28		0·36		0·29		0·40		0·35		0·31	

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* Every hourly observation of the Direction of the Wind was classed, by the rule given in the Introduction, with one, or divided between two, of the Eight Principal Directions.

Aggregate Pressures of different Winds, 1865.

TABLE XXII.—*Showing for the year* 1865 *the Sums of the Pressures of the Winds which blew at each Hour of the Day, from each of the Eight Principal Directions, with a recorded force greater than* 0·1 *lb. on the square foot.*

Bombay Civil Time.	N.	NE.	E.	SE.	S.	SW.	W.	NW.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Midnight.	3·85	4·75	2·05	4·70	3·40	11·10	34·55	18·80
1 A.M.	4·60	5·25	4·85	5·50	2·30	14·75	38·60	17·85
2 „	2·60	7·15	2·60	5·25	2·50	13·25	35·25	18·20
3 „	4·45	9·85	2·35	6·30	4·35	11·60	36·10	13·60
4 „	2·85	12·70	4·85	7·15	2·20	10·65	35·20	12·40
5 „	5·20	12·00	4·20	6·30	9·15	6·40	29·55	11·20
6 „	6·80	6·20	4·90	5·55	8·35	6·55	25·50	11·55
7 „	8·50	7·25	5·65	8·70	7·90	6·45	25·10	8·45
8 „	7·45	6·15	7·65	7·30	13·30	4·30	24·85	10·00
9 „	5·80	5·80	9·60	10·10	11·25	4·75	28·50	7·90
10 „	4·50	4·70	10·80	9·65	9·60	7·85	30·85	8·85
11 „	4·30	3·30	6·65	7·95	10·90	10·25	36·45	14·60
Noon.	2·35	2·70	3·95	5·35	9·35	11·50	44·00	21·70
1 P.M.	3·50	1·55	3·00	2·15	12·25	11·40	45·90	33·45
2 „	1·95	0·40	1·20	1·60	9·20	10·75	51·50	46·00
3 „	1·30	0·80	0·90	0·80	7·65	8·75	55·80	51·50
4 „	1·40	0·40	0·50	0·70	6·40	8·40	51·35	54·95
5 „	1·05	0·05	0·25	1·25	6·05	6·50	41·05	58·80
6 „	1·05	0·10	1·70	0·70	3·05	7·60	38·90	55·80
7 „	1·55	0·20	0·60	1·00	5·35	7·60	34·20	53·90
8 „	2·20	0·25	0·50	2·30	5·70	7·95	34·65	46·35
9 „	2·00	2·60	1·15	3·75	7·20	6·75	30·20	32·75
10 „	4·25	2·10	2·45	6·20	5·95	6·35	32·30	25·00
11 „	3·15	2·20	3·80	4·20	5·65	6·70	32·65	20·85

Relative Frequency of different Winds, 1865.

TABLE XXIII.—*Showing for the year* 1865 *the number of times on which the Wind was observed to blow at each Hour of the Day from each of the Eight Principal Directions, with a recorded force greater than* 0·1 *lb. on the square foot.*

Bombay Civil Time.	N.	NE.	E.	SE.	S.	SW.	W.	NW.
Midnight.	19·0	16·5	9·5	7·0	6·5	22·5	93·5	79·5
1 A.M.	26·5	19·5	8·5	10·0	3·5	29·5	95·5	75·0
2 „	20·5	28·5	7·0	10·5	5·0	29·0	91·5	78·0
3 „	26·0	37·0	10·5	9·0	6·5	26·5	95·5	63·0
4 „	21·0	41·5	18·0	8·0	8·0	24·0	93·0	55·5
5 „	25·5	45·5	13·0	16·5	15·5	17·5	85·5	59·0
6 „	42·5	28·0	17·5	20·0	15·0	19·0	85·0	67·0
7 „	47·5	29·0	23·0	28·5	15·5	19·5	86·0	53·0
8 „	44·5	26·5	28·5	28·5	20·5	15·5	85·0	54·0
9 „	33·5	25·5	42·5	32·0	25·0	13·0	88·5	39·0
10 „	26·0	27·0	45·0	30·5	21·5	18·0	95·5	38·5
11 „	25·0	17·5	34·0	25·0	21·0	21·0	109·5	49·0
Noon.	12·5	13·0	18·5	17·0	19·5	25·5	129·0	64·0
1 P.M.	11·5	6·5	11·5	11·0	22·5	24·5	128·0	87·5
2 „	6·5	2·5	4·0	6·5	17·0	25·0	138·5	103·0
3 „	4·0	3·0	3·0	3·0	14·0	23·5	142·5	108·0
4 „	5·5	1·0	1·5	3·0	8·0	25·0	139·0	117·0
5 „	3·5	0·5	1·5	4·0	9·5	19·5	130·5	135·0
6 „	3·0	1·0	2·0	4·0	7·5	21·0	128·0	137·5
7 „	4·5	1·0	1·5	3·5	8·0	19·0	118·0	138·5
8 „	6·0	1·5	2·0	5·5	7·5	18·0	108·0	140·5
9 „	7·0	8·0	5·0	4·5	8·0	19·0	96·0	127·5
10 „	14·5	9·0	6·0	6·5	9·5	16·0	99·0	112·5
11 „	14·0	10·0	7·0	6·5	8·5	17·5	100·0	97·5

Pressure of Wind, 1865.

TABLE XXIV.—*Mean Estimated Force of Wind, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Mean Monthly Force and its Variation from the Mean of the Year, the unit of pressure being one pound on the square foot.*

1865.	MONTHS.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1	...	0·23	0·16	0·38	0·22	0·31	0·51	0·35	0·37	...	0·25	0·29
2	...	·23	·20	...	·24	·33	...	·42	·23	0·28	·31	·23
3	0·17	·24	·18	·20	·19	·23	·53	·39	...	·32	·16	...
4	·24	·23	·38	·15	·22	...	·84	·43	·22	·24	·24	·15
5	·14	...	...	·15	·25	·34	1·09	·39	·31	·13	...	·15
6	·13	·11	·36	·28	·47	·42	0·88	·25	·28	·08	·29	·17
7	·25	·18	·35	·21	...	1·19	·77	...	·25	·21	·32	·22
8	...	·22	·32	·29	·31	1·95	·78	·25	·24	...	·27	·23
9	·24	·23	·34	...	·36	0·93	...	·25	·25	·14	·38	·32
10	·23	·25	·38	·35	·38	·78	·40	·13	...	·12	·25	...
11	·20	·30	...	·27	·36	...	·39	·18	·47	·25	·18	·18
12	·22	...	...	·47	·32	·58	·43	·28	·48	·33	...	·23
13	·30	·33	·80	·29	·53	·56	·43	...	·64	·33	·17	·28
14	·18	·22	·30	·18	...	·40	·47	·40	·50	·15	·21	·28
15	...	·14	·17	...	·35	·35	·37	·20	·23	...	·16	·40
16	·17	·19	·23	...	·26	·44	...	·17	·19	·19	·30	·34
17	·13	·15	·16	·22	·30	·33	·37	·32	...	·12	·25	...
18	·14	·30	·23	·23	·56	...	·40	·60	·25	·09	·31	·33
19	·16	...	...	·26	·40	·24	·39	·56	·21	·18	...	·30
20	·15	·39	·30	·35	·40	·23	·36	...	·22	·18	·22	·26
21	·20	·32	·31	·18	...	·38	·37	·76	·25	...	·29	·36
22	...	·38	·27	·27	·22	·41	·42	·54	·29	...	·17	·25
23	·14	·35	·25	...	·28	·35	...	·56	·25	·18	·15	·30
24	·16	...	·40	·21	...	·27	·41	·50	...	·11	·16	...
25	·14	·33	·37	·25	·29	...	·36	·48	·15	·21	·43	...
26	·24	·43	...	·23	·28	·49	·32	·39	·22	·16	...	·23
27	·18	...	·36	·20	·26	·56	·20	·35	·25	·16	·29	·58
28	·28	·25	·45	·29	·35	·32	·29	...	·17	·18	·21	·61
29	...		·30	·27	...	·48	·26	·33	·18	...	·20	·23
30	·23		·45	...	·39	·48	...	·40	·20	·39	·21	·39
31	·33		·37		·32		·34	·56		·37		...
Monthly Means.	0·20	0·26	0·32	0·26	0·33	0·51	0·48	0·39	0·28	0·20	0·25	0·29
Annual Variation.	−0·11	−0·05	+0·01	−0·05	+0·02	+0·20	+0·17	+0·08	−0·03	−0·11	−0·06	−0 02

	lbs.
The mean force for the year	0·31
The greatest monthly mean (that of June)..	0·51
The least monthly mean (that of January or October)	0·20
Difference.........	0·31

Pressure of Wind, 1865.

TABLE XXV.—*The Mean Diurnal Variation of the Estimated Force of Wind for each Month, and for the whole Year; or the Excess of the Mean Hourly Force above the respective Monthly and Annual Means: the unit of pressure being one pound on the square foot.*

1865. Bombay Civil Time.	MONTHS.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	−0·02	−0·07	−0·16	−0·07	−0·03	−0·12	+0·12	+0·05	−0·06	+0·01	−0·15	−0·11	−0·05
1 A.M.	−·10	−·06	−·11	−·01	+·12	+·16	+·10	+·06	−·01	−·09	−·02	−·15	−·01
2 "	−·10	−·09	−·10	−·04	+·08	+·05	+·04	+·05	·00	−·10	·00	−·14	−·03
3 "	−·09	−·12	−·10	−·07	+·02	+·11	+·01	+·02	+·04	−·09	+·03	−·13	−·03
4 "	−·09	−·15	−·09	−·09	+·01	+·11	−·03	+·07	+·01	−·10	+·05	−·08	−·03
5 "	−·08	−·09	−·13	−·12	−·13	+·10	+·05	·00	·00	−·02	−·07	+·19	−·02
6 "	−·04	−·09	−·13	−·13	−·16	−·03	−·03	−·02	·00	−·04	−·11	·00	−·06
7 "	−·03	−·07	−·14	−·14	−·14	+·01	+·02	−·06	·00	−·03	−·08	−·03	−·06
8 "	·00	−·04	−·15	−·14	−·12	+·08	−·06	−·08	+·02	·00	−·08	−·01	−·05
9 "	+·02	−·06	−·13	−·02	−·11	−·06	−·01	−·02	+·02	+·08	−·08	−·03	−·03
10 "	−·03	−·06	−·11	−·04	−·07	−·07	−·02	+·03	+·05	+·08	−·05	−·07	−·03
11 "	·00	−·07	−·02	+·04	−·03	−·03	−·03	+·06	+·05	+·12	−·03	−·09	·00
NOON.	−·01	·00	+·06	+·11	+·04	−·08	+·06	−·04	+·01	+·12	+·03	−·09	+·02
1 P.M.	−·01	+·10	+·19	+·19	+·10	+·03	+·03	−·07	+·05	+·04	+·06	+·01	+·06
2 "	+·02	+·13	+·26	+·15	+·14	+·02	+·03	−·01	+·04	+·07	+·13	+·11	+·09
3 "	+·07	+·21	+·31	+·18	+·14	+·02	−·04	+·01	+·01	+·06	+·18	+·13	+·11
4 "	+·10	+·21	+·31	+·15	+·18	−·02	−·10	−·03	+·05	+·06	+·13	+·13	+·10
5 "	+·09	+·14	+·22	+·01	+·11	−·01	−·08	−·03	+·01	+·01	+·09	+·19	+·06
6 "	+·09	+·16	+·20	−·05	+·02	−·06	−·07	−·03	−·01	·00	+·06	+·19	+·04
7 "	+·12	+·14	+·21	−·08	−·05	−·05	−·08	−·05	−·04	−·03	+·05	+·21	+·03
8 "	+·05	+·07	+·09	−·08	−·06	+·02	+·01	·00	−·06	−·02	+·03	+·14	+·02
9 "	·00	−·02	−·08	−·01	−·12	·00	·00	·00	−·06	−·01	−·05	+·01	−·03
10 "	·00	−·07	−·15	+·01	−·06	+·02	+·04	+·02	−·04	−·02	−·10	−·05	−·03
11 "	−·04	−·11	−·16	+·05	+·03	−·11	+·15	−·02	−·08	−·02	−·13	−·10	−·04

The mean force of the Wind for the hours from 10 P. M. to 9 A. M. .... 0·28
The mean force of the Wind for the hours from 10 A. M. to 9 P. M. .... 0·36

The mean force for 24 hours .... 0·32

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M. and a Minimum between 6 and 7 A.M.

7 m o

Barometric Pressure, 1866.

TABLE I.—*Mean Height of Standard Barometer (No. 58), Corrected for Temperature, for each Day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1866.	MONTH.											
Date	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·916	29·853	...	29·765	29·810	...	29·658	29·808	29·769	29·891	29·951
2	29·893	·917	·859	29·829	·778	·812	29·762	·608	...	·692	·920	...
3	·893	·901	...	·826	·737	...	·779	·574	·758	·684	·936	·912
4	·931	...	...	·766	·737	·845	·765	·669	·728	·777	...	·894
5	·942	·886	·840	·765	·756	·839	·697	...	·752	·818	·931	·878
6	·890	·923	·852	·789	...	·797	·658	·852	·788	·822	...	·838
7	...	·979	·864	·779	·745	·723	·630	·821	·826	...	·882	·877
8	·940	·978	·893	...	·753	·730	...	·792	·794	·843	·876	·930
9	·988	·971	·901	·789	·790	·767	·659	·685	...	·831	·880	...
10	·999	·989	·852	·808	·790	...	·648	·602	·736	·799	·880	·983
11	·975	...	...	·784	·769	·681	·563	·603	·779	·794	...	30·017
12	·969	·943	·931	·728	·754	·638	·564	...	·797	·847	·908	·026
13	·951	·902	·985	·783	...	·613	·607	·616	·774	·856	·963	29·967
14	...	·902	·912	·797	·812	·605	·665	·633	·784	...	·948	·950
15	·984	·899	·864	...	·810	·536	...	·723	·755	·802	·941	·975
16	·965	·894	·920	·791	·808	·479	·613	·752	...	·792	·951	...
17	·964	...	·950	·819	·806	...	·602	·761	·748	·816	·980	30·016
18	·964	·898	...	·843	·804	·452	·621	·797	·775	·850	...	·001
19	·933	·898	·877	·840	·801	·476	·685	...	·818	·846	·951	·002
20	·946	·896	·875	·860	...	·508	·701	·735	·837	·827	·953	·029
21	...	·878	·879	·866	·769	·548	·667	·712	·820	...	·933	·048
22	·994	·850	·823	...	·756	·623	...	·694	·802	·703	·926	·033
23	·992	·863	·770	·875	·725	·711	·639	·688	...	·681	·917	...
24	30·010	·883	·809	·883	...	...	·680	·677	·860	·712	·926	·076
25	29·995	...	...	·873	·729	·651	·658	...	·829	·766	...	...
26	30·003	·845	·863	·834	·766	·662	·629	...	·809	·861	·931	·032
27	·003	·849	·809	·841	...	·723	·646	·752	·849	·909	·901	29·977
28	...	·847	·820	·841	·796	·770	·676	·699	·838	...	·922	·959
29	29·974		·838	...	·793	·781	...	·698	·815	·907	·963	·950
30	·946		·840	·783	·796	·760	·695	·770	...	·907	·964	...
31	·896		...		·798		·627	·803		·897		·893
Monthly Mean.	29·959	29·905	29·867	29·816	29·775	29·675	29·661	29·706	29·795	29·808	29·927	29·969
Annual Variation.	+ ·137	+ ·083	+ ·045	− ·006	− ·047	− ·147	− ·161	− ·116	− ·027	− ·014	+ ·105	+ ·147

	in.
Mean of months from January to March and October to December	29·907
Mean of months from April to September	29·737
Mean for the Year	29·822
The greatest monthly mean (that of December)	29·969
The least monthly mean (that of July)..	29·661
Difference............	0·308

Barometric Pressure, 1866.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year; or the Excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+ ·008	+ ·005	+ ·003	− ·030	+ ·005	+ ·002	+ ·009	+ ·009	+ ·004	+ ·001	− ·001	+ ·003	+ ·001
1 A.M.	− ·001	− ·007	− ·013	− ·005	− ·008	− ·013	− ·008	− ·008	− ·009	− ·014	− ·015	− ·008	− ·009
2 „	− ·013	− ·020	− ·015	− ·019	− ·020	− ·027	− ·022	− ·024	− ·021	− ·022	− ·025	− ·018	− ·020
3 „	− ·024	− ·029	− ·032	− ·026	− ·026	− ·033	− ·030	− ·034	− ·028	− ·028	− ·031	− ·028	− ·029
4 „	− ·027	− ·029	− ·023	− ·028	− ·026	− ·025	− ·028	− ·033	− ·027	− ·024	− ·023	− ·030	− ·027
5 „	− ·020	− ·021	− ·010	− ·016	− ·016	− ·018	− ·026	− ·026	− ·016	− ·014	− ·013	− ·020	− ·018
6 „	− ·005	− ·003	+ ·011	+ ·001	+ ·002	·000	− ·009	− ·012	+ ·001	+ ·009	+ ·010	− ·001	·000
7 „	+ ·019	+ ·024	+ ·031	+ ·021	+ ·024	+ ·016	+ ·008	+ ·007	+ ·022	+ ·030	+ ·032	+ ·024	+ ·021
8 „	+ ·047	+ ·048	+ ·053	+ ·042	+ ·041	+ ·031	+ ·022	+ ·024	+ ·042	+ ·047	+ ·054	+ ·050	+ ·042
9 „	+ ·066	+ ·068	+ ·067	+ ·052	+ ·049	+ ·040	+ ·030	+ ·034	+ ·052	+ ·060	+ ·066	+ ·064	+ ·054
10 „	+ ·069	+ ·069	+ ·064	+ ·058	+ ·047	+ ·042	+ ·038	+ ·039	+ ·050	+ ·054	+ ·053	+ ·063	+ ·054
11 „	+ ·053	+ ·053	+ ·048	+ ·043	+ ·037	+ ·035	+ ·033	+ ·031	+ ·040	+ ·035	+ ·040	+ ·042	+ ·041
Noon.	+ ·023	+ ·022	+ ·024	+ ·022	+ ·023	+ ·025	+ ·022	+ ·019	+ ·018	+ ·008	+ ·011	+ ·010	+ ·019
1 P.M.	− ·010	− ·006	− ·004	− ·002	·000	+ ·009	+ ·008	+ ·004	− ·006	− ·017	− ·018	− ·021	− ·005
2 „	− ·035	− ·037	− ·030	− ·028	− ·022	− ·012	− ·006	− ·013	− ·028	− ·040	− ·038	− ·047	− ·028
3 „	− ·048	− ·050	− ·048	− ·044	− ·037	− ·029	− ·021	− ·025	− ·043	− ·054	− ·048	− ·055	− ·042
4 „	− ·049	− ·051	− ·053	− ·052	− ·048	− ·037	− ·032	− ·034	− ·049	− ·052	− ·049	− ·055	− ·047
5 „	− ·047	− ·048	− ·052	− ·049	− ·042	− ·039	− ·032	− ·027	− ·038	− ·041	− ·040	− ·040	− ·041
6 „	− ·035	− ·035	− ·038	− ·037	− ·028	− ·027	− ·022	− ·016	− ·025	− ·029	− ·026	− ·025	− ·029
7 „	− ·015	− ·016	− ·021	− ·017	− ·014	− ·013	− ·004	− ·001	− ·008	− ·005	− ·007	− ·003	− ·010
8 „	+ ·004	+ ·005	− ·001	− ·001	+ ·002	+ ·007	+ ·008	+ ·015	+ ·010	+ ·017	+ ·011	+ ·014	+ ·008
9 „	+ ·017	+ ·018	+ ·015	+ ·014	+ ·013	+ ·017	+ ·020	+ ·027	+ ·022	+ ·026	+ ·019	+ ·027	+ ·020
10 „	+ ·020	+ ·022	+ ·022	+ ·022	+ ·024	+ ·027	+ ·026	+ ·033	+ ·024	+ ·025	+ ·020	+ ·027	+ ·024
11 „	− ·022	+ ·017	+ ·015	+ ·018	+ ·017	+ ·018	+ ·020	+ ·023	+ ·017	+ ·020	+ ·011	+ ·015	+ ·014

In the Mean Diurnal Variation for the year—

A Minimum occurs..................at 3 A.M.
A Maximum ....at 9 or 10 A.M.
A Minimum ....at 4 P.M.
And a Maximum ....at 10 P.M.

Temperature of the Air, 1866.

TABLE III.—*Mean Temperature of the Air for each Day of Bombay Civil Time: also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1866.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	70·5	77·0	...	81·7	83·9	...	78·3	80·4	81·1	78·8	75·9
2	75·4	71·3	76·9	76·2	82·2	84·8	82·1	77·1	...	82·3	79·0	...
3	73·7	70·6	...	75·9	82·1	...	81·3	76·3	79·9	80·4	79·3	76·5
4	70·1	...	...	76·6	82·5	84·4	81·5	79·3	79·6	80·0	...	78·5
5	65·5	68·2	77·9	78·1	82·7	85·1	80·9	...	77·5	80·6	78·6	77·9
6	65·4	69·5	77·0	79·1	...	85·5	78·0	80·0	79·6	80·7	...	77·3
7	...	69·2	77·3	78·1	83·2	85·9	79·6	79·6	80·3	...	79·5	78·4
8	71·3	66·2	76·5	...	83·1	86·1	...	79·1	80·2	81·2	78·3	78·5
9	73·2	65·3	76·0	79·4	82·1	86·3	81·4	78·8	...	82·1	77·2	...
10	75·1	67·5	76·6	78·9	81·7	...	81·5	78·7	78·8	81·9	78·3	76·9
11	74·3	...	...	78·5	81·7	85·9	78·6	77·6	79·4	82·2	...	76·5
12	73·7	69·6	77·0	78·5	81·8	82·0	79·1	...	81·1	82·8	77·2	75·6
13	73·0	73·2	76·2	78·9	...	82·1	78·9	79·0	80·1	83·0	77·8	73·5
14	...	71·7	78·6	80·0	82·4	82·9	80·7	79·4	79·5	...	77·9	72·9
15	73·6	71·0	78·7	...	82·2	80·3	...	79·2	80·8	82·3	78·3	73·1
16	74·4	72·1	77·2	79·9	82·6	80·4	81·2	79·9	...	82·0	79·4	...
17	73·7	...	76·0	79·2	81·8	...	81·2	79·6	80·4	83·6	80·5	74·3
18	72·5	...	...	79·3	82·0	80·5	79·4	79·9	80·7	83·9	...	73·6
19	72·4	71·7	77·1	79·7	82·7	80·0	79·2	...	80·4	83·3	78·2	73·7
20	72·4	71·5	78·2	79·4	...	79·0	76·9	79·0	80·6	81·5	77·4	75·0
21	...	73·3	78·6	79·7	82·1	80·7	75·5	79·1	80·4	...	78·8	75·2
22	75·0	76·5	78·5	...	83·0	81·6	...	78·8	81·2	81·6	77·6	75·9
23	77·5	75·9	77·7	80·8	83·6	81·8	77·0	79·1	...	81·9	76·4	...
24	76·9	77·4	77·0	80·6	...	...	80·8	79·8	80·7	81·1	76·2	77·3
25	76·5	...	...	79·7	83·5	82·0	81·1	...	80·4	79·2	...	...
26	74·9	76·8	76·9	80·5	83·1	82·2	81·1	...	79·6	79·4	76·3	75·4
27	73·5	75·9	76·8	81·0	...	82·1	79·8	80·6	79·2	79·3	76·0	74·3
28	...	76·7	76·6	81·6	83·9	82·2	77·4	81·0	79·3	...	75·8	73·5
29	71·7		77·5	...	84·1	81·3	...	79·7	80·0	81·2	76·7	74·0
30	71·7		76·8	81·2	84·3	81·3	77·8	80·4	...	79·6	76·4	...
31	68·9		...		83·8		78·4	80·2		79·5		71·9
Monthly Mean.	72·9	71·8	77·2	79·2	82·7	82·7	79·6	79·2	80·0	81·4	77·8	75·4
Annual Variation.	−5·4	−6·5	−1·1	+0·9	+4·4	+4·4	+1·3	+0·9	+1·7	+3·1	−0·5	−2·9

Mean of months from January to April, November and December	75°·7
Mean of months from May to October	80·9
Mean for the Year	78·3
The greatest monthly mean (that of May or June)	82·7
The least monthly mean (that of February)	71·8
Difference	10·9

Temperature of the Air, 1866.

TABLE IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month and for the whole Year; or the Excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 2·7	− 3·4	− 2·2	− 2·8	− 2·6	− 1·4	− 0·6	− 0·9	− 1·9	− 2·6	− 3·5	− 3·1	− 2·3
1 A.M.	− 3·3	− 4·2	− 2·5	− 3·2	− 2·9	− 1·8	− 0·7	− 0·9	− 2·4	− 2·8	− 3·9	− 3·4	− 2·7
2 „	− 3·7	− 4·5	− 2·8	− 3·5	− 3·1	− 1·9	− 0·9	− 1·1	− 2·5	− 3·2	− 4·1	− 3·7	− 2·9
3 „	− 4·1	− 4·8	− 3·4	− 4·0	− 3·4	− 2·1	− 1·1	− 1·2	− 2·6	− 3·6	− 4·5	− 4·1	− 3·2
4 „	− 4·8	− 4·9	− 4·1	− 4·6	− 3·7	− 2·3	− 1·0	− 1·5	− 2·9	− 3·7	− 4·7	− 4·4	− 3·5
5 „	− 5·2	− 5·3	− 4·7	− 4·7	− 3·9	− 2·6	− 1·1	− 1·5	− 2·9	− 4·1	− 5·3	− 4·6	− 3·8
6 „	− 5·5	− 5·6	− 5·2	− 4·7	− 3·7	− 2·3	− 1·0	− 1·6	− 2·9	− 4·4	− 5·4	− 5·0	− 3·9
7 „	− 5·4	− 5·2	− 4·2	− 2·5	− 1·5	− 1·4	− 0·5	− 1·2	− 1·9	− 3·4	− 4·4	− 4·7	− 3·0
8 „	− 2·8	− 2·6	− 1·6	− 0·2	− 0·2	− 0·1	− 0·1	− 0·3	− 0·5	− 1·6	− 2·2	− 2·5	− 1·2
9 „	− 0·3	− 0·5	+ 0·8	+ 1·0	+ 1·1	+ 0·8	+ 0·6	+ 0·7	+ 0·8	+ 0·2	− 0·2	− 0·7	+ 0·4
10 „	+ 1·6	+ 1·5	+ 2·8	+ 2·3	+ 2·0	+ 1·4	+ 1·1	+ 1·4	+ 1·6	+ 1·9	+ 1·9	+ 1·1	+ 1·7
11 „	+ 4·0	+ 4·2	+ 3 8	+ 3·6	+ 3·1	+ 2·1	+ 1·1	+ 1·6	+ 2·4	+ 3·2	+ 4·1	+ 3·3	+ 3·0
NOON.	+ 5·4	+ 6·0	+ 4·6	+ 4·6	+ 4·1	+ 2·6	+ 1·6	+ 2·1	+ 3·0	+ 4·6	+ 6·3	+ 5·5	+ 4·2
1 P.M.	+ 6·7	+ 7·0	+ 5·3	+ 5·3	+ 4·8	+ 2·9	+ 2·1	+ 2·4	+ 3·7	+ 5·4	+ 7·5	+ 7·0	+ 5·0
2 „	+ 6·9	+ 7·1	+ 5·3	+ 5·7	+ 5·0	+ 3·2	+ 2·0	+ 2·3	+ 3·9	+ 5·7	+ 7·9	+ 7·3	+ 5·2
3 „	+ 6·6	+ 6·9	+ 4·9	+ 5·7	+ 4·8	+ 3·1	+ 1·9	+ 1·7	+ 3·9	+ 5·6	+ 7·3	+ 6·8	+ 4·9
4 „	+ 5·8	+ 6·2	+ 4·1	+ 4·9	+ 4·1	+ 2·8	+ 1·2	+ 1·3	+ 3·5	+ 4·9	+ 5·9	+ 6·2	+ 4·2
5 „	+ 3·6	+ 4·5	+ 2·8	+ 3·5	+ 2·8	+ 1·9	+ 0·3	+ 0·5	+ 2·2	+ 2·8	+ 2·8	+ 3·2	+ 2·6
6 „	+ 1·7	+ 2·0	+ 0·8	+ 1·0	+ 0·8	+ 0·6	− 0·2	− 0·2	+ 0·5	+ 0·9	+ 1·4	+ 1·4	+ 0·9
7 „	+ 0·9	+0·6	0·0	− 0·2	− 0·7	− 0·4	− 0·5	− 0·4	− 0·2	+ 0·2	+ 0·5	+ 0·6	0·0
8 „	+ 0·2	− 0·1	− 0·3	− 0·9	− 1·3	− 1·1	− 0·7	− 0·6	− 0·8	− 0·5	− 0·1	− 0·1	− 0·5
9 „	− 0·7	− 0·8	− 0·7	− 1·4	− 1·7	− 1·3	− 1·0	− 0·8	− 1·2	− 1·2	− 0·9	− 0·9	− 1·0
10 „	− 1·5	− 1·8	− 1·2	− 1·9	− 1·9	− 1·4	− 0·9	− 0·8	− 1·4	− 1·9	− 2·3	− 2·0	− 1·6
11 „	− 2·4	− 2·3	− 1·9	− 2·3	− 2·2	− 1·5	− 0·8	− 0·8	− 1·4	− 2·4	− 3·2	− 2·8	− 2·0

Mean of the hours from 9 P.M. to 8 A.M. .... 75°·7 } Difference = 5°·2
Mean of the hours from 9 A.M. to 8 P.M. .... 80·9 }

Mean of 24 hours .... 78·3

In the Mean Diurnal Variation for the year a Maximum occurs at 2 P.M. and a Minimum at 6 A.M.

Temperature of the Ground, 1866.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1866. MONTH.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.
	°	°	°	°	°	°	°	°
January	74·0	−5·3	76·7	−3·3	80·4	−2·1	82·4	−0·9
February	72·9	−6·4	74·9	−5·1	79·3	−3·2	81·8	−1·5
March	78·3	−1·0	79·3	−0·7	81·8	−0·7	82·0	−1·3
April	80·2	+0·9	80·8	+0·8	82·7	+0·2	82·8	−0·5
May	83·7	+4·4	83·2	+3·2	84·0	+1·5	83·7	+0·4
June	83·7	+4·4	84·0	+4·0	85·5	+3·0	84·9	+1·6
July	80·9	+1·6	82·0	+2·0	84·5	+2·0	85·0	+1·7
August	79·9	+0·6	80·6	+0·6	83·1	+0·6	83·9	+0·6
September	80·7	+1·4	80·8	+0·8	82·7	+0·2	83·4	+0·1
October	82·1	+2·8	81·8	+1·8	83·4	+0·9	83·5	+0·2
November	78·6	−0·7	79·1	−0·9	82·0	−0·5	83·4	+0·1
December	76·3	−3·0	77·3	−2·7	80·2	−2·3	83·0	−0·3

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to April, November and December	76·7	78·0	81·1	82·6
Do. of May to October	81·8	82·1	83·9	84·1
Do. for the Year	79·3	80·0	82·5	83·3
Greatest monthly mean (that of May or June)	83·7	......	......	......
Do. do. (that of June)	......	84·0	85·5	......
Do. do. (that of July	......	......	......	85·0
Least monthly mean (that of February)	72·9	74·9	79·3	81·8
Differences	10·8	9·1	6·2	3·2

Temperature of the Ground, 1866.

TABLE VI.—*Showing, for each Hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine inches respectively below the surface, and its Mean Diurnal Variation for the Year.*

1866. Bombay Civil Time.	DEPTH. 1 Inch. Mean Temperature.	DEPTH. 1 Inch. Excess over the mean of 24 hours.	DEPTH. 9 Inches. Mean Temperature.	DEPTH. 9 Inches. Excess over the mean of 24 hours.
	°	°	°	°
Midnight.	77·8	− 1·5	80·1	+ 0·1
1 A.M.	77·5	− 1·8	80·0	0·0
2 „	77·3	− 2·0	80·0	0·0
3 „	77·0	− 2·3	79·9	− 0·1
4 „	76·7	− 2·6	79·8	− 0·2
5 „	76·5	− 2·8	79·8	− 0·2
6 „	76·4	− 2·9	79·7	− 0·3
7 „	76·9	− 2·4	79·6	− 0·4
8 „	78·0	− 1·3	79·6	− 0·4
9 „	79·1	− 0·2	79·7	− 0·3
10 „	80·1	+ 0·8	79·7	− 0·3
11 „	80·9	+ 1·6	79·8	− 0·2
Noon.	81·8	+ 2·5	80·0	0·0
1 P.M.	82·5	+ 3·2	80·1	+ 0·1
2 „	82·8	+ 3·5	80·2	+ 0·2
3 „	82·8	+ 3·5	80·3	+ 0·3
4 „	82·4	+ 3·1	80·4	+ 0·4
5 „	81·6	+ 2·3	80·5	+ 0·5
6 „	80·5	+ 1·2	80·5	+ 0·5
7 „	79·7	+ 0·4	80·4	+ 0·4
8 „	79·3	0·0	80·4	+ 0·4
9 „	78·8	− 0·5	80·3	+ 0·3
10 „	78·4	− 0·9	80·2	+ 0·2
11 „	78·0	− 1·3	80·1	+ 0·1

	DEPTH. 1 Inch.	DEPTH. 9 Inches.
	°	°
Mean of hours from 10 P.M. to 9 A.M.	77·5	......
Ditto 10 A.M. to 9 P.M.	81·1	......
Ditto 1 A.M. to Noon	......	79·9
Ditto 1 P.M. to Midnight	......	80·3
Mean of 24 hours	79·3	80·1
Maximum at 2 or 3 P.M.	82·8	......
Ditto 5 or 6 P.M.	......	80·5
Minimum at 6 A.M.	76·4	......
Ditto 7 or 8 A.M.	......	79·6
Differences	6·4	0·9

Temperature of Evaporation, 1866.

TABLE VII.—*Mean Temperature of Evaporation for each Day of Bombay Civil Time; also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1866.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	61·5	69·2	...	76·1	77·2	...	76·5	77·0	77·7	72·4	66·5
2	69·6	64·4	71·6	70·3	76·7	78·4	78·5	76·2	...	78·9	72·3	...
3	67·6	65·5	...	69·3	76·9	...	78·0	75·6	77·6	78·1	70·8	67·4
4	63·6	...	...	70·7	77·5	79·7	77·9	76·9	77·2	76·8	...	67·5
5	57·6	61·4	73·9	73·0	77·4	79·1	77·6	...	75·6	77·6	72·3	66·7
6	57·3	62·2	72·2	73·1	...	79·3	76·2	77·0	76·4	78·2	...	68·1
7	...	63·4	71·8	73·3	75·5	78·9	77·3	76·7	77·1	...	72·6	71·2
8	66·1	58·3	70·7	...	74·0	79·2	...	76·5	76·6	78·6	69·9	71·8
9	68·7	55·6	70·8	72·9	74·0	80·0	78·5	76·4	...	79·1	70·5	...
10	70·1	58·4	70·9	72·2	75·3	...	78·2	76·9	76·5	78·3	70·9	69·7
11	69·4	...	...	72·3	76·2	80·4	76·7	76·7	76·1	77·8	...	68·5
12	68·7	58·1	72·5	73·7	75·3	78·3	77·1	...	76·5	78·5	70·7	67·1
13	65·7	64·6	72·2	74·7	...	78·0	77·1	77·1	76·1	78·0	70·0	67·5
14	...	66·5	70·5	75·0	75·3	78·6	78·1	77·1	76·4	...	67·6	67·9
15	67·8	66·6	69·4	...	76·9	78·1	...	77·0	76·4	76·7	66·5	68·3
16	67·7	67·5	71·3	74·1	76·8	78·1	78·4	77·4	...	77·8	69·7	...
17	67·4	...	69·5	73·2	76·7	...	78·3	77·0	76·4	78·7	72·6	68·3
18	66·7	...	...	73·8	77·2	78·2	77·1	77·2	76·1	78·6	...	67·6
19	66·6	64·2	72·6	74·5	78·1	77·8	76·7	...	75·7	76·4	71·4	66·7
20	67·1	65·5	74·3	72·7	...	77·0	76·0	77·1	75·1	75·3	72·1	69·4
21	...	68·1	74·7	72·9	76·5	78·3	74·8	76·5	75·0	...	71·6	69·5
22	69·5	68·7	73·7	...	76·4	78·7	...	76·6	76·3	75·6	70·2	70·6
23	70·4	67·9	73·2	75·4	77·5	78·7	76·0	76·8	...	75·0	69·4	...
24	70·4	69·2	71·8	75·9	...	...	78·1	77·0	77·3	75·1	70·1	68·9
25	70·4	...	...	74·3	77·2	78·8	77·9	...	76·3	72·5	...	...
26	69·8	71·2	70·9	75·0	77·5	78·5	77·6	...	75·1	73·1	68·4	64·6
27	68·3	72·1	70·2	76·2	...	78·6	77·2	76·9	74·9	73·6	67·7	63·8
28	...	70·5	69·4	76·1	78·4	78·5	76·1	77·0	74·9	...	66·9	64·3
29	64·0		69·2	...	77·3	78·2	...	76·9	75·9	71·5	66·0	64·8
30	59·9		69·4	76·2	77·3	77·9	76·2	77·1	...	71·3	66·3	...
31	58·9		...		77·0		76·5	76·9		71·2		66·3
Monthly Mean.	66·5	64·8	71·4	73·6	76·6	78·6	77·2	76·8	76·2	76·3	69·9	67·7
Annual Variation.	−6·5	−8·2	−1·6	+0·6	+3·6	+5·6	+4·2	+3·8	+3·2	+3·3	−3·1	−5·3

Mean of months from January to April, November and December	69·0°
Mean of months from May to October	76·9
Mean for the Year...	73·0
The greatest monthly mean (that of June)......................................	78·6
The least monthly mean (that of February)	64·8
Difference	13·8

Temperature of Evaporation, 1866.

Table VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 0·9	− 1·2	− 0·4	− 0·7	− 0·8	− 0·5	− 0·2	− 0·3	− 0·8	− 1·2	− 0·9	− 1·2	− 0·8
1 A.M.	− 1·0	− 1·8	− 0·6	− 1·1	− 1·1	− 0·6	− 0·3	− 0·4	− 1·0	− 1·1	− 1·3	− 1·2	− 1·0
2 "	− 1·3	− 1·7	− 0·7	− 1·3	− 1·2	− 0·8	− 0·3	− 0·5	− 1·1	− 1·3	− 1·7	− 1·7	− 1·1
3 "	− 1·6	− 2·0	− 1·1	− 1·5	− 1·4	− 0·9	− 0·6	− 0·5	− 1·1	− 1·6	− 2·3	− 2·1	− 1·4
4 "	− 2·3	− 2·2	− 1·5	− 2·1	− 1·5	− 1·1	− 0·7	− 0·9	− 1·0	− 1·9	− 2·4	− 2·2	− 1·6
5 "	− 2·8	− 2·5	− 2·0	− 2·0	− 1·5	− 1·2	− 0·6	− 0·8	− 1·1	− 1·9	− 3·1	− 2·5	− 1·8
6 "	− 3·2	− 2·6	− 2·4	− 1·8	− 1·6	− 1·1	− 0·4	− 0·9	− 1·2	− 1·9	− 3·1	− 3·2	− 1·9
7 "	− 3·4	− 3·1	− 1·8	− 0·8	− 0·8	− 0·5	− 0·1	− 0·7	− 0·5	− 1·5	− 2·3	− 2·6	− 1·5
8 "	− 2·5	− 2·1	− 0·7	0·0	− 0·3	− 0·1	+ 0·1	0·0	+ 0·3	− 0·9	− 1·2	− 1·7	− 0·8
9 "	− 1·5	− 1·3	− 0·3	+ 0·1	+ 0·2	+ 0·4	+ 0·4	+ 0·6	+ 0·9	0·0	− 0·7	− 1·2	− 0·2
10 "	− 0·8	− 0·4	+ 0·9	+ 0·6	+ 0·3	+ 0·5	+ 0·6	+ 1·0	+ 1·1	+ 0·4	− 0·7	− 0·6	+ 0·2
11 "	+ 0·5	+ 0·2	+ 1·7	+ 1·1	+ 0·7	+ 0·8	+ 0·7	+ 0·9	+ 1·3	+ 0·5	− 0·9	− 0·4	+ 0·6
Noon.	+ 1·3	+ 1·7	+ 2·4	+ 1·5	+ 1·2	+ 1·0	+ 1·0	+ 1·3	+ 1·5	+ 1·2	− 0·2	0·0	+ 1·2
1 P.M.	+ 2·2	+ 3·0	+ 2·6	+ 1·7	+ 1·5	+ 1·0	+ 1·3	+ 1·4	+ 1·7	+ 1·6	+ 1·1	+ 1·4	+ 1·7
2 "	+ 2·9	+ 3·7	+ 2·5	+ 1·8	+ 1·8	+ 1·2	+ 1·1	+ 1·3	+ 1·5	+ 2·1	+ 2·4	+ 3·1	+ 2·1
3 "	+ 3·1	+ 3·9	+ 2·2	+ 1·9	+ 1·8	+ 1·2	+ 1·0	+ 0·9	+ 1·4	+ 2·3	+ 3·4	+ 3·7	+ 2·2
4 "	+ 3·0	+ 3·6	+ 1·7	+ 1·4	+ 1·7	+ 1·0	+ 0·5	+ 0·6	+ 1·1	+ 2·4	+ 3·6	+ 3·7	+ 2·0
5 "	+ 2·7	+ 2·7	+ 0·7	+ 1·3	+ 1·3	+ 0·6	0·0	− 0·1	+ 0·3	+ 2·8	+ 2·8	+ 2·7	+ 1·5
6 "	+ 2·2	+ 1·8	− 0·1	+ 0·5	+ 0·5	+ 0·1	− 0·3	− 0·2	− 0·3	+ 0·9	+ 2·7	+ 2·3	+ 0·8
7 "	+ 1·7	+ 1·2	− 0·5	+ 0·1	+ 0·1	− 0·2	− 0·4	− 0·5	− 0·6	+ 0·7	+ 2·4	+ 2·0	+ 0·5
8 "	+ 1·4	+ 0·6	− 0·4	− 0·2	− 0·1	− 0·4	− 0·4	− 0·6	− 0·7	+ 0·5	+ 2·3	+ 1·5	+ 0·3
9 "	+ 1·0	+ 0·5	− 0·4	− 0·3	− 0·3	− 0·5	− 0·7	− 0·7	− 0·8	+ 0·2	+ 1·7	+ 1·1	+ 0·1
10 "	+ 0·2	− 0·5	− 0·4	− 0·4	− 0·3	− 0·4	− 0·5	− 0·7	− 0·8	− 0·4	+ 0·4	+ 0·3	− 0·3
11 "	− 0·9	− 0·6	− 0·8	− 0·3	− 0·5	− 0·4	− 0·4	− 0·3	− 0·8	− 0·9	− 0·2	− 0·8	− 0·6

	°
Mean of the hours from 10 P.M. to 9 A.M.	71·9
Mean of the hours from 10 A.M. to 9 P.M.	74·1
Mean of 24 hours	73·0

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M. and a Minimum at 6 A.M.

Temperature of Dew-point, 1866.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1866. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	55·6	65·5	...	74·0	74·7	...	75·8	75·7	76·5	69·7	61·2
2	66·8	60·6	69·3	67·8	74·8	76·2	77·3	75·9	...	77·8	69·4	...
3	64·5	62·8	...	66·2	75·0	...	76·8	75·3	76·8	77·5	66·8	62·5
4	59·9	...	...	66·6	75·7	78·1	76·7	76·0	76·3	75·6	...	61·4
5	51·9	57·2	72·3	70·8	75·4	77·1	76·5	...	74·9	76·5	69·6	60·4
6	51·2	57·9	70·1	70·5	...	77·1	75·5	76·0	75·3	77·3	...	63·4
7	...	60·1	69·5	71·3	72·5	76·4	76·5	75·7	75·9	...	69·6	68·0
8	63·4	52·7	68·0	...	70·2	76·8	...	75·5	75·3	77·7	65·9	68·8
9	66·5	47·9	68·4	70·1	70·8	77·9	77·6	75·4	...	78·1	67·5	...
10	67·9	51·9	68·6	69·2	72·8	...	77·1	76·3	75·7	76·7	67·5	66·3
11	67·1	...	...	69·6	74·1	78·6	76·0	76·3	74·9	76·2	...	64·6
12	66·3	48·8	70·6	71·8	72·9	77·0	76·3	...	74·8	77·0	67·7	62·8
13	61·7	59·5	70·6	73·1	...	76·6	76·4	76·4	74·6	76·1	66·4	64·6
14	...	63·8	66·7	73·0	72·5	77·1	77·2	76·3	75·2	...	62·1	65·4
15	65·0	64·3	74·7	...	74·9	77·4	...	76·2	74·7	74·7	59·7	66·0
16	64·3	65·3	68·7	71·7	74·6	77·3	77·4	76·4	...	76·3	65·0	...
17	64·3	...	66·3	70·6	74·8	...	77·3	76·0	74·8	77·0	69·2	65·5
18	63·7	...	...	71·5	75·5	77·4	76·4	76·2	74·3	76·8	...	64·6
19	63·6	60·0	70·7	72·4	76·4	77·1	75·9	...	73·8	73·7	68·4	63·5
20	64·3	62·2	72·2	69·8	...	76·3	75·7	76·4	73·0	72·9	68·8	66·8
21	...	65·5	73·2	70·0	74·4	77·5	74·5	75·6	72·8	...	68·3	66·9
22	66·9	64·7	71·7	...	73·9	77·7	...	75·8	74·5	73·3	66·7	68·2
23	67·1	63·9	71·4	73·3	75·2	77·6	75·6	76·0	...	72·3	66·0	...
24	67·3	65·3	69·6	74·1	...	...	77·2	76·0	76·1	72·5	67·4	64·7
25	67·6	...	...	72·2	75·0	77·8	76·7	...	74·7	69·6	...	...
26	67·3	68·7	68·2	72·9	75·5	77·2	76·3	...	73·3	70·5	64·5	58·2
27	65·8	70·5	67·2	74·5	...	77·4	76·3	75·5	73·3	71·3	63·7	57·2
28	...	67·6	66·0	74·0	76·5	77·3	75·6	75·6	73·3	...	62·1	58·8
29	60·0		65·1	...	74·7	77·1	...	76·0	74·3	67·3	59·9	59·3
30	51·7		65·9	74·4	75·3	76·6	75·6	75·8	...	67·5	60·4	...
31	51·7		...		74·5		75·8	75·7		67·5		63·5
Monthly Mean.	63·0	60·7	68·8	71·3	74·3	77·1	76·4	75·9	74·7	74·3	66·1	63·7
Annual Variation.	− 7·5	− 9·8	− 1·7	+ 0·8	+ 3·8	+ 6·6	+ 5·9	+ 5·4	+ 4·2	+ 3·8	− 4·4	− 6·8

	°
Mean of months from January to April, November and December	65·6
Mean of months from May to October	75·4
Mean for the Year	70·5
The greatest monthly mean (that of June)	77·1
The least monthly mean (that of February)	60·7
Difference	16·4

Temperature of Dew-point, 1866.

TABLE X.—*The Mean Diurnal Variation of the Temperature of Dew-point for each Month, and for the whole Year; or the Excess of the Mean Temperature of the Dew-point above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	+ 0·1	0·0	+ 0·3	+ 0·2	− 0·2	− 0·2	− 0·1	0·0	− 0·3	− 0·7	+ 0·4	− 0·4	− 0·1
1 A.M.	+ 0·2	− 0·6	+ 0·2	− 0·2	− 0·4	− 0·2	− 0·3	− 0·2	− 0·5	− 0·5	− 0·1	− 0·1	− 0·2
2 "	− 0·1	− 0·4	+ 0·2	− 0·4	− 0·6	− 0·3	− 0·2	− 0·3	− 0·6	− 0·6	− 0·7	− 0·9	− 0·4
3 "	− 0·3	− 0·8	− 0·1	− 0·5	− 0·7	− 0·4	− 0·5	− 0·3	− 0·5	− 0·9	− 1·4	− 1·3	− 0·6
4 "	− 1·2	− 1·1	− 0·4	− 1·1	− 0·7	− 0·7	− 0·6	− 0·6	− 0·2	− 1·1	− 1·5	− 1·2	− 0·9
5 "	− 1·7	− 1·2	− 0·9	− 0·9	− 0·7	− 0·6	− 0·5	− 0·6	− 0·4	− 1·1	− 2·4	− 1·6	− 1·0
6 "	− 2·3	− 1·2	− 1·1	− 0·7	− 0·8	− 0·7	− 0·3	− 0·7	− 0·5	− 1·0	− 2·2	− 2·7	− 1·2
7 "	− 2·6	− 2·2	− 0·8	− 0·2	− 0·5	− 0·2	0·0	− 0·5	+ 0·2	− 0·9	− 1·5	− 1·8	− 0·9
8 "	− 2·7	− 2·0	− 0·5	0·0	− 0·4	0·0	+ 0·1	+ 0·1	+ 0·7	− 0·7	− 1·1	− 1·6	− 0·7
9 "	− 2·6	− 2·0	− 1·0	− 0·5	− 0·1	+ 0·3	+ 0·2	+ 0·6	+ 1·1	0·0	− 1·2	− 1·8	− 0·6
10 "	− 2·4	− 1·7	0·0	− 0·2	− 0·3	+ 0·2	+ 0·4	+ 0·9	+ 1·0	− 0·2	− 2·2	− 1·7	− 0·5
11 "	− 1·6	− 2·4	+ 0·9	+ 0·1	− 0·2	+ 0·5	+ 0·4	+ 0·7	+ 1·0	− 0·6	− 3·8	− 2·7	− 0·6
Noon.	− 0·6	− 0·9	+ 1·7	+ 0·3	+ 0·2	+ 0·6	+ 0·7	+ 1·1	+ 1·0	− 0·1	− 3·9	− 3·5	− 0·3
1 P.M.	+ 0·1	+ 0·8	+ 1·6	+ 0·4	+ 0·4	+ 0·5	+ 1·0	+ 1·1	+ 1·0	+ 0·2	− 2·3	− 1·9	+ 0·2
2 "	+ 1·2	+ 2·4	+ 1·4	+ 0·4	+ 0·7	+ 0·6	+ 0·9	+ 1·0	+ 0·8	+ 0·8	− 0·3	+ 1·2	+ 0·9
3 "	+ 1·5	+ 2·8	+ 1·1	+ 0·3	+ 0·8	+ 0·6	+ 0·7	+ 0·6	+ 0·6	+ 0·9	+ 2·0	+ 2·7	+ 1·2
4 "	+ 2·0	+ 2·6	+ 0·7	0·0	+ 0·9	+ 0·5	+ 0·3	+ 0·4	+ 0·3	+ 1·5	+ 2·9	+ 3·0	+ 1·3
5 "	+ 2·5	+ 2·2	− 0·2	+ 0·4	+ 0·8	+ 0·3	− 0·2	− 0·2	− 0·3	+ 1·5	+ 3·1	+ 3·0	+ 1·1
6 "	+ 2·6	+ 1·9	− 0·6	+ 0·5	+ 0·5	0·0	− 0·4	− 0·1	− 0·6	+ 1·0	+ 3·6	+ 3·1	+ 1·0
7 "	+ 2·3	+ 1·7	− 0·8	+ 0·2	+ 0·4	+ 0·1	− 0·5	− 0·5	− 0·7	+ 1·0	+ 3·5	+ 3·0	+ 0·8
8 "	+ 2·2	+ 1·1	− 0·4	0·0	+ 0·3	0·0	− 0·3	− 0·6	− 0·6	+ 1·0	+ 3·6	+ 2·6	+ 0·7
9 "	+ 2·1	+ 1·3	− 0·4	+ 0·1	+ 0·2	− 0·2	− 0·6	− 0·7	− 0·6	+ 0·9	+ 3·1	+ 2·3	+ 0·6
10 "	+ 1·1	+ 0·2	− 0·2	+ 0·2	+ 0·3	0·0	− 0·4	− 0·6	− 0·6	+ 0·2	+ 1·8	+ 1·5	+ 0·3
11 "	− 0·1	+ 0·1	− 0·4	+ 0·5	+ 0·2	0·0	− 0·3	− 0·1	− 0·6	− 0·3	+ 0·3	+ 0·2	0·0

	°
Mean of the hours from 1 A.M. to Noon	69·8
Mean of the hours from 1 P.M. to Midnight	71·2
Mean of 24 hours..	70·5

In the Mean Diurnal Variation for the year a Maximum occurs at 4 P.M. and a Minimum at 6 A.M.

Maxima and Minima of different Meteorological Elements, 1866.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1866, *which showed the greatest and the least values of the following elements, viz., Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1866. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	°	°	°	°	°	°	°	°	°
January	30·086	29·825	0·261	88·8	56·6	32·2	75·3	52·0	23·3	73·4	42·6	30·8
February	·053	·779	·274	89·7	58·4	31·3	77·3	50·0	27·3	75·1	38·6	36·5
March	·062	·707	·355	85·0	69·9	15·1	77·3	62·4	14·9	75·5	57·8	17·7
April	29·943	·670	·273	86·9	69·7	17·2	78·7	66·5	12·2	76·2	63·2	13·0
May	·866	·670	·196	89·5	76·7	12·8	80·6	71·6	9·0	77·9	68·3	9·6
June...........	·910	·342	·568	91·5	76·7	14·8	82·2	75·3	6·9	80·3	73·5	6·8
July...........	·822	·500	·322	86·1	74·5	11·6	81·2	73·1	8·1	80·3	72·6	7·7
August.........	·898	·525	·373	85·9	74·3	11·6	79·6	73·7	5·9	78·7	72·8	5·9
September ...	·911	·675	·236	86·0	74·8	11·2	80·2	72·6	7·6	79·0	71·2	7·8
October	·979	·605	·374	91·8	73·1	18·7	83·0	67·3	15·7	81·9	59·5	22·4
November ...	30·049	·823	·226	89·5	68·9	20·6	78·2	60·3	17·9	75·4	47·6	27·8
December ...	·164	·782	·382	88·8	65·5	23·3	77·0	58·4	18·6	73·8	42·3	31·5
Year...........	30·164	29·342	0·822	91·8	56·6	35·2	83·0	50·0	33·0	81·9	38·6	43·3

Pressure of Vapour, 1866.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time: also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1866.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·451	0·631	...	0·838	0·860	...	0·892	0·889	0·912	0·728	0·545
2	0·659	·530	·718	0·681	·856	·902	0·936	·895	...	·952	·721	...
3	·608	·574	...	·643	·869	...	·922	·878	·921	·939	·663	·574
4	·517	...	...	·652	·888	·963	·917	·898	·906	·886	...	·554
5	·388	·469	·794	·754	·880	·930	·911	...	·865	·915	·726	·534
6	·382	·481	·736	·746	...	·932	·882	·896	·876	·936	...	·591
7	...	·521	·720	·767	·790	·910	·912	·887	·894	...	·725	·688
8	·586	·399	·687	...	·739	·922	...	·882	·876	·951	·641	·707
9	·653	·336	·696	·736	·753	·954	·944	·880	...	·963	·674	...
10	·684	·388	·695	·714	·805	...	·930	·906	·887	·929	·675	·647
11	·665	...	...	·724	·843	·978	·896	·906	·865	·904	...	·610
12	·647	·361	·750	·780	·808	·927	·907	...	·863	·928	·680	·574
13	·552	·519	·747	·814	...	·916	·910	·908	·858	·903	·649	·609
14	...	·595	·658	·813	·798	·931	·934	·906	·874	...	·563	·627
15	·618	·604	·620	...	·865	·939	...	·902	·860	·862	·521	·638
16	·606	·624	·701	·778	·856	·938	·939	·911	...	·907	·625	...
17	·603	...	·649	·749	·857	...	·936	·898	·864	·929	·717	·626
18	·592	...	...	·772	·882	·940	·908	·904	·850	·921	...	·610
19	·590	·520	·750	·796	·910	·929	·893	...	·835	·835	·696	·579
20	·607	·565	·791	·730	...	·905	·888	·911	·811	·810	·715	·658
21	...	·631	·817	·735	·854	·944	·855	·885	·806	...	·694	·658
22	·662	·618	·779	...	·836	·948	...	·892	·851	·821	·657	·691
23	·665	·595	·769	·820	·875	·945	·885	·897	...	·795	·641	...
24	·672	·626	·722	·841	...	...	·934	·897	·900	·804	·672	·613
25	·678	...	...	·790	·867	·951	·919	...	·860	·724	...	...
26	·670	·706	·689	·809	·882	·935	·907	...	·821	·749	·610	·490
27	·634	·747	·667	·854	...	·940	·906	·882	·819	·768	·590	·477
28	...	·677	·640	·841	·911	·936	·885	·884	·819	...	·561	·502
29	·519		·620	...	·860	·930	...	·893	·847	·667	·519	·512
30	·386		·637	·850	·877	·917	·885	·892	...	·675	·534	...
31	·389				·854		·892	·889		·675		·585
Monthly Mean.	0·586	0·545	0·707	0·768	0·848	0·932	0·909	0·895	0·861	0·854	0·648	0·596
Annual Variation.	−0·176	−0·217	−0·055	+0·006	+0·086	+0·170	+0·147	+0·133	+0·099	+0·092	−0·114	−0·166

	in.
Mean of months from January to April, November and December	0·642
Mean of months from May to October	0·883
Mean for the Year	0·762
The greatest monthly mean (that of June)	0·932
The least monthly mean (that of February)	0·545
Difference	0·387

Pressure of Vapour, 1866.

TABLE XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	0·000	−0·002	+0·006	+0·005	−0·006	−0·006	−0·002	−0·002	−0·011	−0·019	+0·006	−0·009	−0·003
1 A.M.	+ ·004	− ·014	+ ·002	− ·005	− ·011	− ·007	− ·009	− ·008	− ·015	− ·015	− ·006	− ·005	− ·007
2 „	− ·003	− ·006	+ ·004	− ·010	− ·015	− ·011	− ·005	− ·010	− ·017	− ·019	− ·016	− ·018	− ·010
3 „	− ·008	− ·013	− ·003	− ·013	− ·020	− ·014	− ·014	− ·010	− ·017	− ·027	− ·032	− ·027	− ·016
4 „	− ·024	− ·017	− ·008	− ·028	− ·019	− ·021	− ·018	− ·019	− ·007	− ·035	− ·037	− ·026	− ·022
5 „	− ·034	− ·021	− ·021	− ·023	− ·018	− ·021	− ·016	− ·017	− ·012	− ·033	− ·054	− ·033	− ·025
6 „	− ·044	− ·023	− ·030	− ·017	− ·022	− ·022	− ·009	− ·021	− ·016	− ·031	− ·050	− ·053	− ·028
7 „	− ·050	− ·042	− ·019	− ·005	− ·015	− ·007	·000	− ·014	+ ·002	− ·025	− ·034	− ·037	− ·020
8 „	− ·050	− ·041	− ·011	+ ·002	− ·011	− ·001	+ ·003	− ·004	+ ·019	− ·019	− ·025	− ·032	− ·015
9 „	− ·047	− ·040	− ·019	− ·012	− ·004	+ ·009	+ ·007	+ ·017	+ ·030	− ·004	− ·027	− ·036	− ·010
10 „	− ·046	− ·033	+ ·001	− ·003	− ·008	+ ·005	+ ·013	+ ·027	+ ·027	− ·003	− ·049	− ·034	− ·009
11 „	− ·031	− ·044	+ ·022	+ ·003	− ·005	+ ·014	+ ·014	+ ·021	+ ·028	− ·014	− ·082	− ·053	− ·011
Noon.	− ·014	− ·012	+ ·039	+ ·008	+ ·005	+ ·018	+ ·022	+ ·034	+ ·029	− ·001	− ·077	− ·064	− ·001
1 P.M.	·000	+ ·020	+ ·038	+ ·010	+ ·012	+ ·014	+ ·032	+ ·033	+ ·029	+ ·009	− ·045	− ·029	+ ·010
2 „	+ ·022	+ ·045	+ ·034	+ ·010	+ ·020	+ ·018	+ ·026	+ ·031	+ ·022	+ ·026	+ ·001	+ ·029	+ ·024
3 „	+ ·031	+ ·054	+ ·027	+ ·008	+ ·024	+ ·018	+ ·021	+ ·027	+ ·017	+ ·036	+ ·046	+ ·055	+ ·030
4 „	+ ·041	+ ·048	+ ·018	+ ·003	+ ·026	+ ·014	+ ·008	+ ·010	+ ·007	+ ·045	+ ·063	+ ·060	+ ·029
5 „	+ ·052	+ ·038	− ·004	+ ·011	+ ·024	+ ·007	− ·005	− ·008	− ·010	+ ·041	+ ·068	+ ·060	+ ·023
6 „	+ ·055	+ ·032	− ·015	+ ·013	+ ·014	− ·001	− ·011	− ·005	− ·018	+ ·026	+ ·081	+ ·062	+ ·019
7 „	+ ·047	+ ·029	− ·019	+ ·007	+ ·013	− ·005	− ·013	− ·016	− ·021	+ ·026	+ ·077	+ ·059	+ ·015
8 „	+ ·044	+ ·019	− ·010	+ ·002	+ ·009	− ·002	− ·009	− ·018	− ·017	+ ·026	+ ·080	+ ·052	+ ·015
9 „	+ ·039	+ ·023	− ·008	+ ·004	+ ·006	− ·008	− ·018	− ·021	− ·017	+ ·019	+ ·070	+ ·046	+ ·011
10 „	+ ·020	+ ·002	− ·003	+ ·006	+ ·007	·000	− ·012	− ·019	− ·018	+ ·002	+ ·037	+ ·028	+ ·004
11 „	− ·005	+ ·001	− ·010	+ ·014	+ ·003	− ·001	− ·008	− ·004	− ·018	− ·011	+ ·003	+ ·003	− ·003

	in.
Mean of the hours from Midnight to 11 A.M.	0·747
Mean of the hours from Noon to 11 P.M.	0·777
Mean of 24 hours	0·762

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M., and a Minimum at 6 A.M.

Relative Humidity of the Air, 1866.

Table XIV.—*Mean Relative Humidity of the Air for each Day of Bombay Civil Time: also the Monthly Mean Relative Humidity and its Variation from the Mean of the Year.*

1866.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	0·618	0·681	...	0·783	0·744	...	0·923	0·858	0·861	0·744	0·623
2	0·755	·705	·778	0·758	·783	·758	0·857	·962	...	·863	·737	...
3	·733	·778	...	·727	·796	...	·865	·970	·904	·903	·669	·631
4	·705	...	...	·719	·804	·819	·853	·902	·897	·866	...	·574
5	·619	·680	·836	·788	·791	·774	·863	...	·919	·876	·746	·567
6	·618	·673	·798	·761	...	·764	·921	·880	·870	·897	...	·627
7	...	·734	·774	·802	·707	·740	·905	·878	·865	...	·726	·713
8	·774	·622	·758	...	·657	·744	...	·887	·852	·894	·664	·738
9	·803	·539	·778	·740	·692	·766	·882	·893	...	·879	·727	...
10	·789	·585	·761	·736	·747	...	·868	·925	·904	·854	·708	·708
11	·787	...	...	·755	·781	·793	·917	·955	·865	·825	...	·669
12	·783	·497	·820	·804	·749	·854	·914	...	·817	·831	·738	·648
13	·688	·638	·829	·835	...	·841	·922	·916	·837	·801	·691	·741
14	...	·770	·679	·800	·723	·830	·892	·904	·870	...	·604	·774
15	·752	·800	·630	...	·790	·910	...	·909	·820	·781	·549	·788
16	·715	·798	·756	·768	·774	·906	·882	·893	...	·832	·620	...
17	·732	...	·726	·754	·796	...	·881	·891	·834	·811	·693	·751
18	·746	...	...	·777	·811	·904	·907	·888	·813	·800	...	·743
19	·746	·677	·809	·790	·816	·908	·897	...	·808	·746	·725	·704
20	·764	·736	·826	·734	...	·914	·960	·920	·781	·758	·765	·765
21	...	·774	·839	·727	·777	·902	·970	·891	·777	...	·723	·760
22	·763	·690	·804	...	·743	·880	...	·907	·805	·766	·704	·776
23	·722	·671	·811	·788	·764	·872	·953	·904	...	·733	·709	...
24	·736	·669	·788	·812	...	...	·890	·883	·863	·760	·750	·659
25	·754	...	...	·785	·759	·872	·868	...	·835	·736	...	...
26	·781	·768	·751	·781	·780	·853	·855	...	·817	·749	·677	·561
27	·773	·837	·728	·808	...	·858	·891	·858	·824	·773	·657	·570
28	...	·751	·707	·786	·790	·853	·942	·841	·822	...	·642	·620
29	·673		·667	...	·739	·870	...	·881	·831	·638	·579	·615
30	·500		·696	·803	·749	·859	·929	·860	...	·672	·602	...
31	·563		...		·740		·915	·863		·679		·754
Monthly Mean.	0·722	0·696	0·761	0·773	0·763	0·838	0·898	0·899	0·843	0·799	0·686	0·683
Annual Variation.	−0·058	−0·084	−0·019	−0·007	−0·017	+0·058	+0·118	+0·119	+0·063	+0·019	−0·094	−0·097

Mean of the months from January to April, November and December	0·720
Mean of the months from May to October..	0·840
Mean for the Year...	0·780
The greatest monthly mean (that of August)	0·899
The least monthly mean (that of December)	0·683
Difference...........	0·216

Relative Humidity of the Air, 1866.

TABLE XV.—*The Mean Diurnal Variation of Relative Humidity of the Air for each Month, and for the whole Year; or the Excess of the Mean Relative Humidity above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	+ ·065	+ ·078	+ ·060	+ ·076	+ ·057	+ ·030	+ ·018	+ ·024	+ ·042	+ ·048	+ ·085	+ ·056	+ ·053
1 A.M.	+ ·085	+ ·077	+ ·063	+ ·075	+ ·060	+ ·042	+ ·015	+ ·018	+ ·051	+ ·058	+ ·080	+ ·071	+ ·058
2 „	+ ·089	+ ·094	+ ·076	+ ·080	+ ·062	+ ·041	+ ·027	+ ·022	+ ·052	+ ·066	+ ·072	+ ·060	+ ·062
3 „	+ ·097	+ ·093	+ ·085	+ ·090	+ ·066	+ ·042	+ ·021	+ ·023	+ ·056	+ ·067	+ ·063	+ ·058	+ ·063
4 „	+ ·085	+ ·090	+ ·096	+ ·089	+ ·074	+ ·041	+ ·014	+ ·024	+ ·076	+ ·063	+ ·063	+ ·071	+ ·065
5 „	+ ·082	+ ·098	+ ·097	+ ·100	+ ·081	+ ·049	+ ·018	+ ·025	+ ·068	+ ·073	+ ·057	+ ·068	+ ·068
6 „	+ ·081	+ ·103	+ ·100	+ ·106	+ ·072	+ ·042	+ ·024	+ ·024	+ ·066	+ ·087	+ ·066	+ ·049	+ ·068
7 „	+ ·063	+ ·066	+ ·086	+ ·056	+ ·021	+ ·029	+ ·019	+ ·019	+ ·055	+ ·061	+ ·065	+ ·060	+ ·050
8 „	− ·003	+ ·002	+ ·025	+ ·002	− ·010	+ ·001	+ ·009	+ ·011	+ ·032	+ ·020	+ ·017	+ ·018	+ ·010
9 „	− ·058	− ·041	− ·040	− ·046	− ·032	− ·015	− ·007	− ·005	+ ·004	− ·012	− ·025	− ·027	− ·025
10 „	− ·095	− ·076	− ·066	− ·063	− ·058	− ·032	− ·015	− ·012	− ·020	− ·053	− ·094	− ·062	− ·054
11 „	− ·126	− ·137	− ·071	− ·083	− ·080	− ·043	− ·016	− ·023	− ·036	− ·093	− ·166	− ·124	− ·083
Noon.	− ·133	− ·136	− ·073	− ·102	− ·094	− ·050	− ·021	− ·024	− ·052	− ·111	− ·197	− ·172	− ·097
1 P.M.	− ·145	− ·126	− ·090	− ·118	− ·103	− ·059	− ·028	− ·036	− ·071	− ·122	− ·190	− ·166	− ·104
2 „	− ·127	− ·109	− ·094	− ·121	− ·101	− ·065	− ·028	− ·036	− ·082	− ·113	− ·156	− ·120	− ·096
3 „	− ·114	− ·093	− ·092	− ·124	− ·092	− ·063	− ·030	− ·027	− ·085	− ·102	− ·109	− ·081	− ·084
4 „	− ·089	− ·086	− ·082	− ·110	− ·075	− ·061	− ·024	− ·020	− ·085	− ·081	− ·071	− ·075	− ·072
5 „	− ·029	− ·061	− ·074	− ·076	− ·050	− ·044	− ·014	− ·021	− ·066	− ·037	− ·001	− ·016	− ·041
6 „	+ ·018	− ·011	− ·040	− ·019	− ·011	− ·017	− ·003	+ ·002	− ·033	− ·003	+ ·047	+ ·027	− ·004
7 „	+ ·032	+ ·017	− ·024	+ ·012	+ ·028	+ ·004	+ ·002	− ·003	− ·016	+ ·017	+ ·062	+ ·046	+ ·015
8 „	+ ·046	+ ·022	− ·006	+ ·023	+ ·037	+ ·027	+ ·015	− ·002	+ ·004	+ ·035	+ ·079	+ ·055	+ ·028
9 „	+ ·065	+ ·044	+ ·007	+ ·038	+ ·044	+ ·026	+ ·015	+ ·001	+ ·015	+ ·048	+ ·087	+ ·071	+ ·038
10 „	+ ·064	+ ·042	+ ·025	+ ·055	+ ·052	+ ·037	+ ·016	+ ·004	+ ·020	+ ·046	+ ·093	+ ·074	+ ·044
11 „	+ ·051	+ ·051	+ ·034	+ ·072	+ ·055	+ ·038	+ ·020	+ ·020	+ ·020	+ ·048	+ ·074	+ ·062	+ ·045

Mean of the hours from 8 A.M. to 7 P.M.	0·727
Mean of the hours from 8 P.M. to 7 A.M.	0·833
Mean of 24 hours.	0·780

In the Mean Diurnal Variation for the year a Maximum occurs between 5 and 6 A.M., and a Minimum at 1 P.M.

Extent of Cloudy Sky, 1866.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time : also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1866. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...			...	2·9	2·9	...	8·0	5·1	5·6	0·2	0·3
2	0·1				3·4	3·1	7·0	7·9	...	7·0		...
3		0·7	...	1·3	2·9	...	6·7	8·0	7·4	7·6		2·7
4	1·8	...	...		1·8	5·7	7·0	8·0	7·2	5·8	...	1·7
5	0 2	1·3	1·6	0·1	2·1	3·1	7·2	...	7·6	4·5		1·0
6		1·0	2·2		...	3·7	7·8	5·5	5·8	6·8	...	2·1
7	...	3·5	0·4	0·3	3·2	3·3	7·5	7·6	5·9	...	0·1	2·1
8	2·8	1·0		...	2·0	2·8	...	7·6	5·2	6·4		0·4
9	5·1		0·2	0·8	1·8	2·8	6·2	7·8	...	3·8	0·1	...
10	0·1		2·0	2·5	2·1	...	7·0	8·0	6·2	5·1		
11		...	...	2·0	1·3	5·5	8·0	8·0	5·9	2·5	...	
12			0·7	0·3	1·7	7·2	8·0	...	4·4	2·0		
13	0·2		1·1	1·6	...	6·3	8·0	8·0	5·0	2·8		
14	...		2·2	0·3	2·9	6·8	6·5	7·8	6·8	...		0·5
15	1·3		3·7	...	2·4	7·8	...	7·7	6·2	4·6		
16	3·5	0·6	4·3		2·0	7·7	6·6	7·5	...	6·3	0·3	...
17	1·5		5·1	0·8	2·5	...	6·8	7·1	5·6	6·3	1·2	
18	0·3	...	...	1·0	1·7	7·5	6·6	7·1	4·0	6·5	...	
19	2·5		0·2	0·3	3·7	7·7	8·0	...	3·0	1·5	2·1	0·4
20	1·7	1·6		0·8	...	7·8	8·0	7·7	4·5	2·5	1·8	1·6
21	...	0·9	2·6	2·6	3·2	7·9	8·0	7·9	7·3	...	0·8	3·8
22	0·1	3·5	0·3	...	4·4	7·6	...	7·4	6·6	3·8	4·8	5·0
23	0·5	1·5	2·1	1·1	3·0	8·0	8·0	7·2	...	3·8	3·6	...
24			0·5	2·0	...	...	7·3	7·9	3·3	2·3	0·7	
25		...	...	1·0	3·0	7·9	7·9	...	3·1		...	...
26	0·6			3·3	6·0	6·8	7·6	...	2·5	0·3		
27	0·1			2·0	...	6·0	8·0	7·3	2·0			
28	...			0·5	2·5	5·1	8·0	7·0	0·7	...		
29				...	3·3	6·8	...	7·3	3·0	1·8		
30				3·2	4·0	6·6	8·0	6·0	...	1·1		...
31			...		3·4		8·0	5·8		1·0		
Monthly Mean.	0·9	0·7	1·2	1·1	2·8	5·9	7·5	7·4	5·0	3·8	0·6	0·9
Annual Variation.	− 2·2	− 2·4	− 1·9	− 2·0	− 0·3	+ 2·8	+ 4·4	+ 4·3	+ 1·9	+ 0·7	− 2·5	− 2·2

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December	0·9
Mean of the months from May to October	5·4
Mean for the Year	3·1
The greatest monthly mean (that of July)	7·5
The least monthly mean (that of November)	0·6
Difference	6·9

Extent of Cloudy Sky, 1866.

TABLE XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	0·5	0·1	0·4	2·0	4·3	5·4	6·8	7·5	5·1	3·4	0·3	0·4	3·0
1 A.M.	0·5	0·1	0·5	2·2	4·5	5·7	6·5	7·4	5·3	3·5	0·4	0·3	3·1
2 "	0·5	0·2	0·7	1·6	4·5	6·2	6·8	7·6	6·1	3·6	0·5	0·4	3·2
3 "	0·5	0·2	0·9	1·9	4·4	6·1	7·0	7·7	5·8	3·7	0·4	0·4	3·2
4 "	0·2	0·2	0·9	0·6	3·0	6·5	7·2	7·3	5·2	3·3	0·4	0·3	2·9
5 "	0·2	0·2	0·9	1·2	3·6	6·8	7·2	7·3	5·2	3·8	0·3	0·2	3·1
6 "	0·5	1·0	0·9	1·3	4·2	6·7	7·3	7·5	6·1	5·2	0·5	0·9	3·5
7 "	1·6	1·6	1·0	1·0	4·1	6·4	7·4	7·3	5·6	5·1	0·7	1·2	3·6
8 "	1·5	1·6	0·9	1·0	3·9	6·3	7·6	7·4	4·8	5·0	0·6	1·1	3·5
9 "	1·4	1·6	0·8	0·6	3·5	6·1	7·4	7·3	5·3	4·7	0·6	1·0	3·4
10 "	1·6	1·3	1·7	0·5	1·7	5·8	7·7	7·2	4·8	3·5	0·9	1·0	3·1
11 "	1·4	1·1	1·6	0·5	1·1	5·6	7·9	7·3	4·7	3·3	0·7	1·0	3·0
Noon.	1·0	1·4	1·7	0·4	1·0	5·5	7·8	7·2	4·6	3·3	0·6	1·2	3·0
1 P.M.	0·8	1·2	1·7	0·4	1·1	5·5	7·7	7·3	4·9	3·3	0·9	1·1	3·0
2 "	0·7	1·0	1·5	0·6	1·0	5·3	7·8	7·4	4·9	3·2	1·2	1·2	3·0
3 "	0·7	0·7	1·8	0·5	1·3	5·3	7·8	7·3	5·0	3·1	1·0	1·0	3·0
4 "	0·7	0·9	1·5	0·7	1·8	5·7	7·8	7·5	4·9	3·5	1·0	1·0	3·1
5 "	1·7	0·7	2·0	1·0	2·4	6·1	7·9	7·7	5·2	3·9	0·9	1·4	3·4
6 "	1·7	0·7	2·0	1·5	2·7	6·1	7·8	7·9	5·0	4·0	0·7	1·3	3·4
7 "	1·4	0·3	1·3	1·2	2·6	6·5	8·0	7·8	4·1	3·7	0·8	0·9	3·2
8 "	1·3	0·2	0·8	1·4	2·2	6·1	7·7	7·3	3·8	3·7	0·7	0·8	3·0
9 "	0·8	0·1	1·1	1·5	2·2	5·5	7·5	7·3	4·0	3·4	0·5	0·8	2·9
10 "	0·9	0·1	1·0	1·6	2·6	5·5	7·2	7·5	4·2	3·4	0·3	1·0	2·9
11 "	0·6	0·1	0·4	1·6	3·7	5·6	7·1	7·2	4·6	3·6	0·3	0·8	3·0

Rainfall, 1866.

TABLE XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day and each Month of the year.*

1866.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
		in.				in.	in.	in.	in.	in.		
1							0·07	0·30	0·18			
2							0·31	7·20	0·14			
3							1·06	6·90	0·82	0·56		
4		0·11				0·25	0·18	0·58	0·27			
5							0·42	0·12	0·79			
6							0·59	0·01		0·02		
7							0·08	0·08		0·10		
8							0·72	0·55	0·01	0·02		
9							0·24	0·10	0·06			
10							0·37	0·25	0·12			
11						0·03	7·63	1·83	0·03			
12						0·41	2·97	0·05	0·03			
13						0·14	1·93	0·09	0·03			
14							0·51	0·15	0·32	0·02		
15						1·67	0·28	0·18				
16						0·08	0·13	0·03	0·24			
17						3·47	0·13	0·29	0·12			
18						0·56	1·66	0·35		0·02		
19						1·30	1·15	0·34				
20						3·23	1·60	0·23				
21						0·38	5·07	0·05	0·01			
22						0·08	4·30	0·17				
23							2·41	0·01	0·27			
24												
25						0·09	0·36	0·03				
26						0·13	0·04					
27						0·66	0·59					
28						0·20	1·41					
29						0·76	2·07	0·34				
30						0·03	1·50	0·04				
31							0·56	0·07				
Monthly Total.		0·11				13·47	40·34	20·34	3·44	0·74		
No. of rainy days.		1				18	30	27	16	6		

The day is from 11 P.M. to 11 P.M.	
Total fall of rain in the year	78·44 in.
Total number of rainy days in the year	98
The greatest fall of rain in one month (July)	40·34 in.

No rain fell in the months January, March to May, November and December, nor on any of the days left blank in the above table.

Rainfall, 1866.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
						in.	in.	in.	in.	in.			in.
12 to 1 A.M.						0·46	0·64	0·73	0·35				2·18
1 „ 2 „						0·21	1·06	0·43	0·03	0·05			1·78
2 „ 3 „						0·22	1·01	0·48	0·04	0·19			1·94
3 „ 4 „						0·14	1·43	0·46	0·81	0·02			2·86
4 „ 5 „						0·75	0·79	0·19	0·01				1·74
5 „ 6 „						1·01	1·38	0·43	0·01	0·04			2·87
6 „ 7 „						0·78	0·26	0·20	0·02	0·05			1·31
7 „ 8 „						0·27	0·70	0·06	0·18				1·21
8 „ 9 „						0·78	1·60	0·14					2·52
9 „ 10 „						0·71	1·12	0·26	0·03				2·12
10 „ 11 „						0·44	1·29	0·85					2·58
11 „ 12 „						0·66	1·43	0·97	0·28				3·34
12 „ 1 P.M.						0·86	1·22	1·13					3·21
1 „ 2 „						0·18	2·06	2·39	0·03				4·66
2 „ 3 „						0·09	0·96	5·23					6·28
3 „ 4 „						0·08	0·95	1·72	0·09				2·84
4 „ 5 „						0·01	1·35	1·21	0·10	0·23			2·90
5 „ 6 „						0·09	0·93	0·62	0·01				1·65
6 „ 7 „						0·15	1·81	0·41		0·01			2·38
7 „ 8 „						1·23	3·13	0·57					4·93
8 „ 9 „						0·27	1·90	0·12	0·05	0·02			2·36
9 „ 10 „						0·26	2·58	0·33					3·17
10 „ 11 „						0·31	1·90	0·32	0·05				2·58
11 to 12 „						0·03	1·37	0·54	0·64	0·01			2·59

The above table includes the Rainfall on week-days only.

Rainfall, 1866.

TABLE XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 46 feet above the ground, for each Day and each Month of the Year.*

1866. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
		in.				in.	in.	in.	in.	in.		
1							0·02	0·71	0·13			
2							0·33	7·79	0·66	0·24		
3						[0·24]	0·98	4·94	0·29	0·16		
4		[0·10]					0·09	0·47	0·65			
5							0·52	0·07	0·09			
6							0·28	0·07		0·01		
7							0·73	0·04		0·05		
8							0·15	0·51		[0·02]		
9							0·10	0·09	0·03			
10						[0·03]	2·18	0·78				
11						[0·03]	[6·01]	[0·87]				
12						[0·46]	2·00	0·08	0·03			
13						[0·02]	1·55	[0·16]	0·23			
14						[0·61]	0·18	[0·17]	0·06	[0·02]		
15						0·89	0·18	[0·02]	0·01			
16						[0·99]	0·08	0·19	0·29			
17						2·45	0·30	0·28		[0·02]		
18						1·29	1·64	[0·58]				
19						3·20	[0·86]					
20						0·47	[3·45]	[0·04]				
21						0·07	5·74	[0·19]				
22						0·03	1·26	[0·03]	0·26			
23						0·01	1·27	[0·01]				
24							0·30	[0·03]				
25						0·07	0·01					
26						0·75	0·19					
27						0·01	1·32					
28						0·18	1·12	[0·31]				
29						0·68	1·98	[0·03]				
30						0·05	0·38	0·06				
31							0·62	0·10				
Monthly Totals.		0·10				12·53	35·82	18·62	2·73	0·52		
No. of rainy days.		1				21	31	29	12	7		

The entry of a given day shows the quantity of rain which fell between Noon of that day and Noon of the following day.

The numbers within brackets are derived, wholly or partially, from the corresponding falls registered by Newman's Gauge, for the reasons stated in the Introduction page.

Total fall of rain in the year.. 70·32 in.
Total number of rainy days in the year 101
The greatest fall in one month (July) .... 35·82 in.

No rain was recorded in the months of January, March to May, November and December, nor on any of the days left blank in the above table.

Velocity of Wind, 1866.

TABLE XXI.—*Mean Velocity of the Wind, in miles per hour, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Mean Monthly Velocity and its Variation from the Mean of the Year.*

1866	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1	...	11·79	16·42	...	6·70	15·57	...	22·09	14·31	15·25	7·24	14·89
2	7·42	3·87	15·57	7·56	9·90	11·56	20·74	18·27	...	11·79	7·87	...
3	13·54	5·44	...	13·14	11·16	...	23·53	33·21	22·72	17·14	15·52	13·18
4	22·00	...	...	13·23	9·90	11·43	24·88	30·78	16·96	26·64	...	15·21
5	21·33	8·10	5·35	8·95	10·03	9·49	24·93	...	10·03	13·41	5·80	20·34
6	14·49	12·46	9·85	5·67	...	9·13	19·62	20·25	8·10	9·85	...	12·82
7	...	13·45	15·43	11·88	13·68	8·50	23·80	25·24	7·51	...	10·44	11·20
8	8·73	17·37	17·05	...	10·84	7·02	...	27·31	5·17	9·36	9·67	11·07
9	6·52	10·03	19·44	23·58	10·12	10·57	20·38	29·02	...	7·83	8·19	...
10	10·93	13·41	16·78	20·02	13·59	...	23·40	34·15	15·30	...	4·63	8·91
11	8·05	...	...	15·07	15·57	18·00	32·08	30·91	9·27	...	...	12·60
12	10·84	15·70	10·48	9·76	11·52	36·22	32·44	...	9·90	16·38	11·29	11·83
13	14·89	8·77	15·52	8·37	...	31·05	26·55	14·04	10·17	16·29	11·88	10·71
14	...	8·14	24·66	13·32	10·26	46·17	17·95	19·26	10·57	...	15·03	10·75
15	7·42	9·13	13·09	...	15·34	28·89	...	19·21	18·22	12·28	18·04	9·81
16	7·87	13·99	16·78	8·19	9·49	37·44	14·53	20·25	...	5·35	15·93	...
17	7·15	...	17·05	9·22	12·19	...	18·40	23·58	16·47	7·78	14·49	10·08
18	7·60	...	...	12·37	14·17	37·80	13·50	21·37	9·27	5·31	...	8·95
19	11·52	10·57	19·71	9·40	11·61	41·40	17·23	...	10·08	10·62	7·69	6·52
20	15·57	9·00	21·28	8·19	...	30·51	13·32	19·57	8·46	10·17	8·46	10·12
21	...	11·11	29·61	12·60	11·61	24·88	10·53	13·54	12·19	...	8·77	8·91
22	9·81	13·32	22·50	...	8·68	27·54	...	13·23	13·99	10·80	8·23	7·78
23	7·24	13·68	15·25	10·84	7·38	26·46	19·12	17·55	...	10·66	12·64	...
24	5·13	13·99	11·43	8·37	...	...	22·77	7·51	9·31	9·00	11·47	15·07
25	3·69	...	...	13·14	8·41	29·07	28·62	...	7·20	9·04	...	...
26	14·94	7·02	14·58	14·40	6·52	25·20	25·47	...	10·12	9·49	11·83	13·99
27	17·77	9·13	9·58	13·99	...	20·70	24·48	12·78	11·34	7·47	10·08	13·45
28	...	14·22	13·54	17·73	8·14	21·55	17·01	19·39	11·11	...	10·80	10·75
29	16·78		19·08	...	8·59	23·13	...	15·39	8·82	9·18	17·95	8·86
30	19·93		17·95	7·20	14·04	27·63	27·49	16·11	...	8·55	15·70	...
31	14·98		...		19·17	...	27·00	14·35		5·67		9·58
Monthly Mean.	11·77	11·03	16·32	11·85	11·10	22·49	21·91	20·71	11·46	11·01	11·19	11·50
Annual Variation.	− 2·59	− 3·33	+ 1·96	− 2·51	− 3·26	+ 8·13	+ 7·55	+ 6·35	− 2·90	− 3·35	− 3·17	− 2·86

	Miles.
The Mean Velocity for June to August..	21·70
The Mean Velocity for September to May	11·91
The Mean Velocity for the Year	14·36
The greatest monthly mean (that of June)	22·49
The least monthly mean (that of October)	11·01
Difference............	11·48

Velocity of Wind, 1866.

Table XXII.—*The Mean Diurnal Variation of the Velocity of the Wind, in miles per hour, for each Month and for the whole Year; or the Excess of the Mean Hourly Velocity above the respective Monthly and Annual Means.*

1866. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
12 to 1 A.M.	− 5·53	− 7·11	− 1·44	− 3·78	− 3·51	− 2·20	+ 0·58	+ 0·36	− 2·07	− 4·14	− 5·85	− 4·99	− 3·31
1 „ 2 „	− 5·94	− 5·40	− 2·20	− 5·31	− 3·01	+ 0·09	+ 1·26	+ 0·99	− 4·32	− 3·82	− 4·18	− 5·08	− 3·08
2 „ 3 „	− 4·45	− 7·33	− 4·68	− 5·22	− 3·42	0·00	− 0·04	− 1·75	− 2·97	− 4·00	− 2·65	− 1·66	− 3·18
3 „ 4 „	− 6·03	− 4·18	− 6·75	− 6·70	− 6·39	+ 0·81	+ 1·12	− 1·17	− 2·16	− 2·61	− 2·65	− 1·57	− 3·19
4 „ 5 „	− 5·98	− 4·09	− 8·91	− 6·75	− 3·78	− 0·72	− 1·89	− 0·09	− 1·44	− 4·05	− 3·37	− 1·35	− 3·53
5 „ 6 „	− 4·68	− 3·28	− 9·22	− 6·39	− 4·68	− 1·84	− 0·94	− 2·29	− 0·81	− 3·51	− 1·44	− 1·08	− 3·35
6 „ 7 „	− 0·27	− 2·70	− 10·71	− 5·67	− 6·03	− 0·40	+ 0·45	− 0·36	− 0·27	− 2·61	− 0·85	− 1·12	− 2·55
7 „ 8 „	− 4·09	− 2·88	− 8·55	− 4·81	− 6·16	− 0·13	− 0·85	− 1·30	+ 0·27	− 1·75	+ 0·36	− 0·18	− 2·30
8 „ 9 „	− 4·09	− 2·20	− 7·87	− 4·50	− 3·46	+ 0·94	+ 1·48	− 2·16	− 0·04	− 0·72	+ 0·40	− 0·45	− 1·89
9 „ 10 „	− 2·52	− 2·79	− 3·55	− 3·33	− 0·67	+ 1·71	+ 3·87	+ 0·54	− 1·57	− 0·40	− 0·76	− 1·03	− 0·87
10 „ 11 „	− 3·91	− 3·37	− 3·19	− 2·92	+ 0·13	+ 1·26	+ 1·08	+ 0·58	− 1·71	− 0·76	− 4·45	− 3·46	− 1·73
11 „ 12 „	+ 0·31	− 0·27	+ 1·39	+ 1·89	+ 3·01	+ 2·07	+ 2·11	+ 0·54	+ 0·85	− 0·13	− 4·63	− 3·73	+ 0·28
12 „ 1 P.M.	+ 3·24	+ 3·55	+ 4·99	+ 5·04	+ 4·95	+ 2·56	+ 0·40	− 0·49	+ 2·34	+ 1·66	− 1·62	− 2·16	+ 2·04
1 „ 2 „	+ 5·40	+ 5·76	+ 8·05	+ 9·72	+ 7·42	+ 2·56	+ 0·49	− 0·31	+ 3·24	+ 5·17	+ 1·84	+ 0·85	+ 4·23
2 „ 3 „	+ 6·21	+ 8·28	+ 10·53	+ 9·49	+ 8·28	+ 3·01	+ 2·65	− 0·76	+ 4·32	+ 7·24	+ 5·04	+ 5·58	+ 5·82
3 „ 4 „	+ 6·21	+ 9·27	+ 11·02	+ 9·94	+ 8·14	+ 1·98	+ 0·94	− 0·72	+ 4·23	+ 8·46	+ 7·74	+ 6·66	+ 6·16
4 „ 5 „	+ 8·01	+ 9·31	+ 11·07	+ 11·65	+ 6·70	+ 2·02	+ 0·99	+ 2·29	+ 5·44	+ 7·38	+ 8·82	+ 7·83	+ 6·79
5 „ 6 „	+ 7·74	+ 7·24	+ 9·27	+ 8·59	+ 6·84	+ 0·76	− 0·72	+ 3·69	+ 2·74	+ 5·13	+ 7·20	+ 7·15	+ 5·47
6 „ 7 „	+ 7·60	+ 6·25	+ 8·10	+ 5·58	+ 3·06	− 0·36	− 2·92	+ 0·67	+ 2·25	+ 3·96	+ 7·06	+ 7·02	+ 4·02
7 „ 8 „	+ 6·61	+ 4·99	+ 5·40	+ 3·01	+ 1·17	− 1·53	− 0·31	+ 0·45	+ 1·26	+ 2·61	+ 5·80	+ 3·60	+ 2·75
8 „ 9 „	+ 3·42	+ 2·25	+ 1·89	+ 0·81	− 1·21	− 2·65	− 3·69	+ 1·21	− 1·53	− 0·94	+ 1·98	+ 1·26	+ 0·24
9 „ 10 „	− 0·22	− 1·89	− 0·94	− 1·71	− 2·34	− 2·11	− 2·61	− 0·67	− 2·07	− 3·28	− 3·33	− 3·19	− 2·03
10 „ 11 „	− 2·47	− 4·86	− 2·07	− 3·73	− 2·52	− 3·82	− 2·07	+ 1·75	− 2·29	− 4·59	− 4·68	− 4·27	− 2·97
11 „ 12 „	− 4·18	− 4·41	− 1·84	− 3·37	− 2·61	− 3·55	− 0·72	+ 0·72	− 3·33	− 4·54	− 5·62	− 5·08	− 3·21

	Miles.
The Mean Velocity of the Wind for the hours from 9 P.M. to 9 A.M.	11·46
The Mean Velocity of the Wind for the hours from 9 A.M. to 9 P.M.	17·27
The Mean Velocity for 24 hours	14·36

In the Mean Diurnal Variation for the year a Maximum occurs between 4 and 5 P.M., and a Minimum between 4 and 5 A.M.

Aggregate and Mean Velocities and Relative Frequency of Different Winds, 1866.

TABLE XXIII.—*Showing for the year* 1866, *the Sums of the Velocities, in miles per hour, of the Winds which blew in each Month, from each of the Sixteen Principal Directions; and also the number of Observations which those sums comprise; the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.*

1866.	N.		NNE.		NE.		ENE.		E.		ESE.		SE.		SSE.	
Month.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.
	Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		Miles.	
January	246·0	24·0	7·4	2·0	198·7	36·5	49·9	8·5	433·5	53·0	41·2	7·0	22·9	6·0	7·8	2·0
February	117·0	17·5	12·9	2·0	158·8	26·0	18·3	2·5	494·1	61·5	136·5	14·0	294·0	39·0	88·2	8·0
March	162·3	27·0	16·1	1·0	150·2	33·0	5·8	1·0	63·6	14·5	4·8	0·5	2·7	1·0		
April	44·5	11·0			119·1	30·0			355·7	46·0	2·0	1·0	189·7	19·0		
May			2·0	1·0					0·4	1·0			19·4	2·0		
June									7·6	1·0	18·0	3·0	2142·4	63·0	315·7	9·0
July			17·2	1·0	20·0	2·0	10·4	2·0	139·5	10·0			451·8	24·0	68·0	2·0
August					40·5	5·0							285·1	15·0		
September	101·6	13·0	19·9	8·0	50·7	11·0	9·2	1·0	296·7	36·0	84·8	8·0	556·5	42·0	48·0	3·0
October	707·6	77·0	89·0	17·0	407·7	66·0	216·8	23·0	481·1	70·0	134·6	11·0	918·1	54·0		
November	1620·8	140·0	15·9	2·0	1103·2	132·5	234·3	20·0	865·9	87·0	50·5	6·5				
December	748·3	86·5	16·0	1·0	1518·7	145·5	123·1	12·5	689·0	72·5	24·5	3·0				
Sums	3748·1	396·0	196·4	35·0	3767·6	487·5	667·8	70·5	3827·1	452·5	496·9	54·0	4882·6	265·0	527·7	24·0
Means	9·5		5·6		7·7		9·5		8·5		9·2		18·4		22·0	

[*Continued.*

1866	S.		SSW.		SW.		WSW.		W.		WNW.		NW.		NNW.	
Month.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.	Sums of Velocities.	Number of Observa-tions.
	Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		Miles.		Miles.	
January					70·2	10·0			386·5	20·0	281·0	15·5	5311·6	378·5	241·2	29·0
February	27·8	3·0			6·4	4·0			1227·8	83·5	156·3	11·0	3010·2	211·0	142·2	17·5
March					5·7	2·0	23·7	1·5	954·2	75·5	133·9	7·0	812·7	413·0	80·4	6·0
April	28·2	3·0	13·0	3·0	177·4	22·0	5·0	1·5	932·3	73·0	576·3	39·5	4581·2	292·0		
May	91·9	6·0	55·8	5·0	841·2	61·0	171·4	15·0	2737·5	227·5	230·6	19·0	2429·6	211·5	37·0	5·0
June	2793·0	99·0	415·1	13·0	3960·0	175·0	706·1	29·5	1530·1	105·5	41·5	4·0	874·8	72·0		
July	618·9	29·0	103·2	3·0	3946·8	192·0	1963·9	78·0	6113·6	257·0	154·4	9·0	5·2	1·0		
August	329·2	19·0	124·4	6·0	2249·2	125·0	1544·8	74·5	7725·9	339·5	12·8	1·0	267·8	13·0		
September	169·2	17·0	7·0	2·0	285·7	20·0	372·6	34·0	3250·9	219·0	381·4	29·0	642·8	57·0	155·7	12·0
October	38·8	20·0	7·1	1·0	76·0	7·0	131·4	13·0	1123·9	83·0	317·4	20·0	1277·3	90·0	216·0	19·0
November			9·4	1·0	11·3	1·0	9·9	1·0	54·4	6·5	187·1	13·5	1818·2	119·0	346·8	26·0
December					29·2	4·0			202·2	14·0	170·0	11·5	2561·6	181·5	763·9	52·0
Sums	4097·0	196·0	735·0	34·0	11659·1	623·0	4928·8	248·0	26239·3	1504·0	2642·7	180·0	23593·0	2039·5	1983·2	166·5
Means	20·9		21·6		18·7		19·9		17·4		14·5		11·1		11·3	

For the Months and directions which have no entries 0·0 is to be understood.

The Mean numbers at the foot of the table show the average strength of the winds from each different direction.

Aggregate Velocities of Different Winds, 1866.

TABLE XXIV.—*Showing, for the year 1866, the Sums of the Velocities, per hour, of the Winds which blew at each Hour of the Day from each of the Sixteen Principal Directions.*

Bombay Civil Time.	N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.	WNW.	NW.	NNW.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Midnight.	131·58	12·24	136·42	14·17	67·77	1·48	141·07	53·86	259·33	12·96	527·58	39·15	925·67	78·95	804·73	58·39
1 A.M.	93·17	3·22	133·04	48·26	60·79	0·72	200·56	53·05	296·55	13·27	580·95	15·12	839·05	68·08	883·73	55·21
2 ,,	161·71	10·80	185·69	44·59	92·45	10·08	249·61	56·29	222·70	14·35	556·51	13·00	869·56	38·99	815·85	57·26
3 ,,	134·71	13·23	239·94	26·37	172·84	8·86	225·81	29·97	190·75	18·18	581·85	29·70	855·22	46·89	697·36	55·69
4 ,,	157·03	10·48	244·84	24·84	158·89	6·16	218·11	120·55	80·10	57·01	430·15	88·20	822·37	16·42	529·56	33·19
5 ,,	128·70	28·44	346·81	38·70	236·20	47·79	328·54	54·99	124·60	67·41	378·81	99·85	790·11	38·34	409·41	22·90
6 ,,	118·89	15·48	437·67	47·52	397·69	64·73	309·51	79·74	114·88	95·80	383·49	92·56	705·69	43·02	454·72	9·04
7 ,,	169·83	6·97	388·44	69·48	627·75	71·93	332·30	41·53	115·42	50·35	425·43	57·24	727·78	29·20	348·12	31·36
8 ,,	142·92	7·29	394·65	98·37	518·51	89·41	328·07	61·56	138·96	65·25	329·26	104·44	757·62	24·48	368·46	52·24
9 ,,	171·85	12·87	349·87	96·30	515·79	96·75	289·39	82·80	93·04	30·67	436·14	179·86	773·91	16·51	543·28	57·37
10 ,,	60·70	21·46	279·40	66·19	474·21	45·76	256·27	32·89	163·53		640·44	246·76	778·48	8·73	616·27	30·78
11 ,,	55·93		204·59	31·50	313·27	10·30	226·39	35·10	211·59	29·83	657·81	246·60	871·11	25·63	929·54	61·06
Noon.	98·10	10·57	121·30	35·17	134·50	15·34	110·07		207·27	59·62	650·92	318·85	1121·29	77·44	1231·24	75·33
1 P.M.	24·75		78·61	11·56	48·76	45·83	136·84		178·96	58·81	757·30	346·03	1381·43	162·31	1825·76	116·80
2 ,,	120·37		38·34		34·06		123·66		182·65	33·43	835·29	454·03	1386·65	223·87	2325·04	114·68
3 ,,	125·86	17·23					117·94		103·32	32·40	717·88	413·12	1638·25	220·23	2620·26	89·55
4 ,,	132·30						126·18		104·44		591·03	464·69	1647·38	296·48	2807·21	74·52
5 ,,	232·78						169·47		116·91	22·90	551·11	245·63	1796·60	353·95	2525·89	135·83
7 ,,	275·49		5·22				175·72		218·07	7·06	339·03	171·58	1777·97	273·98	2305·21	210·82
7 ,,	358·40						172·35		182·61		412·56	199·91	1477·98	235·60	2114·77	260·08
8 ,,	314·95	7·02	1·93		10·93		169·11		124·15		415·44	193·03	1197·43	175·03	1990·60	167·44
9 ,,	282·51		8·37	4·86	5·08	2·02	173·65		268·02	6·48	238·14	142·40	1069·00	72·25	1682·71	118·98
10 ,,	217·66		31·63		17·73		157·36		292·05	4·90	258·52	119·61	983·25	58·77	1306·03	80·82
11 ,,	160·27	3·96	58·66	10·28	16·11		152·59	36·49	220·95	12·51	249·84	172·71	958·52	62·57	1039·95	125·93

For the hours and directions which have no entries 0·0 is to be understood.

Relative Frequency of different Winds, 1866.

TABLE XXV.—*Showing, for the year* 1866, *the number of times the Wind was observed to blow at each Hour of the Day from each of the Sixteen Principal Directions.*

Bombay Civil Time.	N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.	WNW.	NW.	NNW.
Midnight.	22·0	3·0	22·0	3·5	11·0	1·0	11·0	2·0	15·0	1·0	26·0	3·5	53·0	9·5	83·0	7·5
1 A.M.	15·5	2·5	23·0	7·0	16·0	1·0	15·0	3·0	13·0	1·0	28·0	2·5	49·5	7·5	83·5	5·0
2 „	25·0	3·0	23·5	4·0	16·5	1·0	12·0	4·0	12·0	1·0	28·0	2·0	52·5	4·5	73·0	6·0
3 „	19·0	4·0	28·5	3·0	19·5	1·0	14·0	2·0	10·0	2·0	30·0	1·0	47·5	4·5	71·0	8·0
4 „	28·5	2·0	45·0	3·0	15·0	1·0	19·0	4·0	5·0	2·0	25·0	6·0	47·0	2·0	58·0	5·5
5 „	22·0	5·0	48·0	3·0	25·5	4·5	22·0	3·0	7·0	3·0	23·0	6·0	45·0	5·0	48·0	4·0
6 „	21·0	3·0	54·0	5·0	34·5	5·5	19·0	4·0	6·0	3 0	23·0	6·0	42·0	4·0	52·0	1·0
7 „	20·0	2·0	44·0	8·0	47·5	7·0	21·5	1·0	6·5	1·5	21·0	2·5	45·0	2·5	40·0	4·0
8 „	14·0	1·0	43·0	6·0	57·0	7·5	20·5	2·0	7·5	2·5	18·0	5·0	45·0	2·0	41·0	5·0
9 „	15·0	1·0	38·0	7·0	54·5	9·5	20·0	2·0	5·0	1·0	20·0	7·5	46·5	1·0	44·0	7·0
10 „	5·0	2·0	34·5	5·5	60·5	4·5	18·0	1·0	10·0		34·0	11·5	44·5	1·0	46·0	4·0
11 „	8·0		27·0	3·5	43·0	1·5	12·0	1·0	13·0	2·0	37·0	11·0	56·0	2·5	64·5	6·0
NOON.	8·0	1·0	14·5	4·5	18·5	1·5	10·0		12·0	2·0	36·0	15·5	70·5	5·0	86·0	8·0
1 P.M.	6·0		9·0	1·0	3.5	5·5	7·0		11·0	2·0	37·0	18·5	82·0	9·5	100·5	9·5
2 „	7·0		3·0		3·0		6·0		8·0	2·0	40·0	22·0	79·0	13·5	110·5	6·0
3 „	6·0	1·0					5·0		3·0	1·0	35·0	19·0	90·0	13·0	122·0	4·0
4 „	5·5						5·0		3·0		28·0	23·5	86·5	16·5	127·5	3·5
5 „	10·0						6·0		4·0	1·0	25·0	15·0	95·5	18·0	117·0	7·5
6 „	14·0		1·0				7·0		8·0	1·0	16·0	11·0	104·0	16·0	111·5	10·5
7 „	20·5						7·0		7·0		20·0	11·5	89·5	13·0	111·5	16·0
8 „	23·0	1·0	1·0		1·0		7·0		6·0		22·0	11·5	75·5	13·0	123·5	11·5
9 „	29·0		3·0	1·0	2·0	1·0	7·0		11·0	1·0	15·0	9·5	71·5	7·5	118·5	11·0
10 „	31·0		9·0		3·0		10·0		13·0	1·0	18·0	6·5	64·5	9·0	115·0	10·0
11 „	28·5	1·0	10·5	1·5	4·0		9·0	1·0	13·0	3·0	20·0	8·5	59·0	8·5	104·0	12·5

For the hours and directions which have no entries 0·0 is to be understood.

Barometric Pressure, 1867.

TABLE I.—*Mean Height of Standard Barometer (No. 58), Corrected for Temperature, for each Day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1867.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·948	29·899	29·838	29·723	29·741	29·698	29·684	...	29·758	29·875	...
2	29·970	·906	·878	·818	·735	...	·663	·660	29·664	·824	·871	30·021
3	·992	...	...	·784	·773	·735	·629	·645	·619	·885	...	29·999
4	·987	·895	...	·757	·776	·753	·686	...	·648	·865	·938	30·018
5	·982	·921	·921	·777	...	·789	·751	·735	·667	·868	·938	·011
6	...	·920	·867	·816	·748	·764	·777	·716	·710	...	·918	29·964
7	·969	·882	·828	...	·751	·735	...	·673	·745	·856	·929	·923
8	·981	·870	·860	·797	·750	·722	·802	·707	...	·837	·968	...
9	·965	·881	·941	·838	·722	...	·785	·723	·732	·848	·998	·947
10	·989	...	...	·865	·732	·639	·757	·714	·721	·826	...	·962
11	·995	·906	·937	·857	·738	·634	·694	...	·726	·789	·962	·949
12	·954	·906	·938	·855	...	·605	·655	·661	·722	·756	·944	·943
13	...	·855	·895	·873	·669	·596	·639	·619	·718	...	·996	·958
14	·909	·888	·926	...	·697	·586	...	...	·699	·798	30·058	·983
15	·944	·906	·943	·834	·712	·586	·656	·610	...	·852	·022	...
16	·949	·884	·894	·830	·711	...	·627	·668	·705	·855	29·993	·996
17	·947	...	...	·845	·732	·577	·569	·738	·714	·809	...	·995
18	·979	·921	·887	·858	·729	·573	·565	...	·721	·765	30·028	30·012
19	·996	·934	...	...	...	·609	·564	·762	·758	·749	·040	·013
20	...	·959	·870	·847	·712	·625	·577	·731	·779	...	·022	29·987
21	·991	·951	·837	...	·724	·643	...	·697	·826	·770	·008	·954
22	·971	·945	·793	·835	·740	·626	·644	·674	...	·782	29·972	...
23	·967	·934	·848	·817	·718	...	·660	·685	·878	·818	30·014	·982
24	·970	...	...	·755	...	·651	·660	·725	·863	·856	...	·962
25	·962	·961	·877	·777	·766	·724	·683	...	·824	·883	29·996	...
26	·935	·955	·860	·818	...	·782	·670	·684	·823	·860	·970	30·000
27	...	·939	·861	·822	·774	·754	·657	·707	·852	...	·998	29·998
28	·914	·914	·871	...	·769	·664	...	·729	·857	...	30·028	·977
29	·934		·849	·790	·740	·651	·603	·715	...	·854	·037	...
30	·971		·810	·764	·713	...	·643	·666	·774	·844	·038	·990
31	·961		...		·731		·689	·670		·861		·985
Monthly Mean.	29·965	29·916	29·879	29·819	29·734	29·671	29·667	29·692	29·750	29·826	29·983	29·981
Annual Variation.	+0·141	+0·092	+0·055	−0·005	−0·090	−0·153	−0·157	−0·132	−0·074	+0·002	+0·159	+0·157

	in.
Mean of months from January to March and October to December	29·925
Mean of months from April to September	29·722
Mean for the Year	29·824
The greatest monthly mean (that of November)	29·983
The least monthly mean (that of July)..	29·667
Difference...........	0·316

Barometric Pressure, 1867.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year; or the Excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·004	+0·007	+0·009	−0·002	+0·004	+0·007	+0·005	+0·006	+0·003	−0·002	−0·009	+0·009	+0·003
1 A.M.	− ·008	− ·006	− ·008	− ·015	− ·008	− ·008	− ·011	− ·008	− ·014	− ·018	− ·021	− ·004	− ·011
2 ,,	− ·021	− ·022	− ·021	− ·025	− ·016	− ·022	− ·026	− ·023	− ·027	− ·026	− ·029	− ·016	− ·023
3 ,,	− ·030	− ·027	− ·029	− ·030	− ·021	− ·029	− ·032	− ·032	− ·034	− ·030	− ·034	− ·024	− ·029
4 ,,	− ·032	− ·029	− ·022	− ·023	− ·018	− ·025	− ·029	− ·030	− ·031	− ·023	− ·028	− ·025	− ·026
5 ,,	− ·022	− ·019	− ·011	− ·010	− ·007	− ·018	− ·023	− ·022	− ·019	− ·010	− ·015	− ·016	− ·016
6 ,,	− ·005	+ ·001	+ ·006	+ ·014	+ ·013	+ ·002	− ·006	− ·007	− ·002	+ ·011	+ ·009	0·000	+ ·003
7 ,,	+ ·020	+ ·026	+ ·030	+ ·037	+ ·033	+ ·019	+ ·009	+ ·014	+ ·018	+ ·034	+ ·034	+0·025	+ ·025
8 ,,	+ ·048	+ ·049	+ ·057	+ ·058	+ ·049	+ ·033	+ ·023	+ ·029	+ ·038	+ ·053	+ ·058	+ ·052	+ ·046
9 ,,	+ ·067	+ ·071	+ ·068	+ ·067	+ ·059	+ ·037	+ ·035	+ ·039	+ ·050	+ ·065	+ ·072	+ ·067	+ ·058
10 ,,	+ ·068	+ ·070	+ ·066	+ ·062	+ ·056	+ ·039	+ ·037	+ ·039	+ ·049	+ ·059	+ ·067	+ ·065	+ ·056
11 ,,	+ ·047	+ ·056	+ ·051	+ ·048	+ ·046	+ ·032	+ ·033	+ ·033	+ ·038	+ ·037	+ ·045	+ ·044	+ ·042
Noon.	+ ·014	+ ·023	+ ·023	+ ·027	+ ·029	+ ·019	+ ·022	+ ·020	+ ·018	+ ·010	+ ·015	+ ·011	+ ·019
1 P.M.	− ·017	− ·008	− ·007	− ·001	+ ·004	+ ·006	+ ·008	+ ·002	− ·004	− ·016	− ·016	+ ·021	− ·002
2 ,,	− ·040	− ·033	− ·033	− ·027	− ·021	− ·012	− ·006	− ·013	− ·024	− ·038	− ·037	− ·044	− ·027
3 ,,	− ·052	− ·051	− ·050	− ·047	− ·042	− ·029	− ·020	− ·028	− ·038	− ·053	− ·049	− ·055	− ·043
4 ,,	− ·052	− ·055	− ·053	− ·056	− ·055	− ·037	− ·030	− ·038	− ·041	− ·053	− ·050	− ·055	− ·048
5 ,,	− ·042	− ·049	− ·048	− ·053	− ·054	− ·040	− ·028	− ·030	− ·035	− ·043	− ·040	− ·043	− ·042
6 ,,	− ·025	− ·039	− ·039	− ·042	− ·042	− ·030	− ·020	− ·021	− ·022	− ·028	− ·025	− ·027	− ·030
7 ,,	− ·005	− ·021	− ·023	− ·027	− ·027	− ·013	− ·007	− ·007	− ·006	− ·007	− ·004	− ·007	− ·013
8 ,,	+ ·013	+ ·002	− ·006	− ·006	− ·010	+ ·004	+ ·007	+ ·007	+ ·010	+ ·014	+ ·014	+ ·011	+ ·005
9 ,,	+ ·024	+ ·015	+ ·010	+ ·011	+ ·005	+ ·015	+ ·016	+ ·023	+ ·023	+ ·022	+ ·020	+ ·023	+ ·017
10 ,,	+ ·024	+ ·020	+ ·015	+ ·018	+ ·012	+ ·023	+ ·022	+ ·030	+ ·022	+ ·021	+ ·018	+ ·022	+ ·021
11 ,,	+ ·015	+ ·014	+ ·010	+ ·014	+ ·011	+ ·021	+ ·017	+ ·021	+ ·017	+ ·014	+ ·008	+ ·014	+ ·015

In the Mean Diurnal Variation for the year—

A Minimum occurs……………………at 3 A.M.
A Maximum ………………………at 9 A.M.
A Minimum ………………………at 4 P.M.
And a Maximum ……………………at 10 P.M.

Temperature of the Air, 1867.

TABLE III.—*Mean Temperature of the Air for each Day of Bombay Civil Time: also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1867. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	73·6	75·9	78·8	83·0	86·3	84·0	81·2	...	79·3	77·8	...
2	73·0	73·6	74·2	79·1	83·9	...	82·2	81·6	80·2	78·1	77·4	75·8
3	73·6	...	...	79·1	84·4	87·0	83·8	79·9	79·5	79·9	...	76·3
4	73·5	71·8	...	80·2	83·7	87·4	78·6	...	80·2	79·3	77·6	76·5
5	73·1	71·3	74·7	80·1	...	87·4	77·1	80·7	79·8	78·9	78·8	75·1
6	...	70·5	76·2	80·4	83·7	86·6	79·4	80·7	79·8	...	80·4	75·9
7	72·2	71·3	77·4	...	84·0	87·1	...	78·8	80·0	81·1	80·3	76·3
8	71·6	71·8	76·0	79·9	84·1	87·3	82·7	80·7	...	81·7	80·7	...
9	72·2	73·2	75·4	80·0	84·0	...	82·5	80·3	81·0	80·7	79·4	76·8
10	74·1	...	...	79·5	84·7	83·5	82·8	77·1	81·1	80·5	...	77·5
11	75·0	73·5	76·5	79·2	85·4	85·4	81·5	...	81·8	79·5	75·4	76·6
12	76·0	73·0	76·7	80·2	...	85·5	82·6	80·3	81·0	80·7	74·6	76·1
13	...	73·3	77·2	80·0	85·2	85·9	80·4	78·4	80·6	...	74·6	75·9
14	75·6	72·9	78·0	...	85·9	83·6	...	...	81·1	80·8	75·4	76·4
15	75·4	74·9	76·7	79·7	85·9	84·8	77·4	77·6	...	78·8	74·8	...
16	76·0	75·7	76·2	80·2	84·0	...	75·7	79·2	80·5	78·4	75·1	75·2
17	76·1	...	...	80·0	82·6	82·7	77·0	77·8	79·1	79·9	...	74·7
18	76·0	74·6	76·6	80·0	83·4	85·4	77·1	...	79·4	81·1	74·4	74·1
19	75·5	71·6	...	...	...	86·5	79·1	79·1	80·9	80·2	75·4	75·0
20	...	70·0	77·6	80·4	83·4	86·2	81·2	80·1	79·8	...	75·7	75·6
21	76·5	70·2	76·6	...	84·2	84·1	...	79·3	77·8	78·3	75·9	75·0
22	74·3	70·2	77·7	81·3	85·0	80·1	81·2	80·1	...	80·3	77·1	...
23	73·3	72·1	77·3	81·9	85·4	...	80·9	79·8	78·6	79·9	77·2	73·8
24	73·6	...	...	84·3	...	82·6	81·9	80·7	75·1	82·2	...	73·3
25	72·4	74·6	77·1	81·9	85·1	82·1	81·6	...	78·3	81·6	77·6	...
26	72·2	76·3	77·6	82·1	...	83·2	79·7	79·3	79·2	80·3	77·4	71·5
27	...	77·4	78·3	82·6	85·7	81·9	78·3	79·4	79·3	...	76·2	70·0
28	74·8	77·1	78·3	...	86·2	80·5	...	78·5	78·7	...	76·4	72·4
29	74·7		79·0	81·9	86·5	83·2	80·7	79·7	...	77·7	71·8	...
30	74·3		79·6	81·9	86·4	...	81·7	79·7	78·2	78·1	74·7	72·9
31	73·2		...		86·3		81·6	80·8		79·9		73·0
Monthly Mean.	74·2	73·1	76·9	80·6	84·7	84·7	80·5	79·7	79·6	79·9	76·6	74·9
Annual Variation.	−4·6	−5·7	−1·9	+1·8	+5·9	+5·9	+1·7	+0·9	+0·8	+1·1	−2·2	−3·9

Mean of months from January to March, and October to December............	75°·9
Mean of months from April to September	81·6
Mean for the Year..	78·8
The greatest monthly mean (that of May or June)	84·7
The least monthly mean (that of February)	73·1
Difference.........	11·6

Temperature of the Air, 1867.

TABLE IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month and for the whole Year; or the Excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 3·1	− 2·9	− 2·6	− 2·4	− 2·6	− 1·5	− 0·9	− 0·9	− 1·3	− 2·5	− 3·0	− 2·8	− 2·2
1 A.M.	− 3·6	− 3·1	− 2·9	− 2·7	− 2·8	− 1·5	− 1·1	− 1·1	− 1·5	− 2·6	− 3·2	− 3·5	− 2·5
2 "	− 3·9	− 3·6	− 3·1	− 3·0	− 3·0	− 1·8	− 1·2	− 1·1	− 1·7	− 2·8	− 3·4	− 3·9	− 2·7
3 "	− 4·2	− 4·2	− 3·6	− 3·4	− 3·2	− 1·5	− 1·4	− 1·4	− 2·0	− 3·0	− 3·7	− 4·4	− 3·0
4 "	− 4·7	− 4·7	− 4·2	− 3·7	− 3·4	− 2·1	− 1·7	− 1·5	− 2·1	− 3·3	− 4·2	− 4·7	− 3·4
5 "	− 5·0	− 5·3	− 4·9	− 4·0	− 3·6	− 2·2	− 1·8	− 1·8	− 2·1	− 3·4	− 4·5	− 5·1	− 3·6
6 "	− 5·4	− 6·0	− 5·3	− 4·2	− 3·5	− 2·2	− 1·7	− 1·7	− 2·1	− 3·5	− 4·8	− 5·6	− 3·8
7 "	− 5·3	− 6·0	− 4·3	− 2·5	− 1·7	− 1·6	− 1·1	− 1·2	− 1·6	− 2·7	− 4·0	− 5·2	− 3·1
8 "	− 3·3	− 3·4	− 1·5	− 0·5	− 0·1	− 0·7	− 0·5	− 0·5	− 0·7	− 1·5	− 2·4	− 2·9	− 1·5
9 "	− 1·1	− 0·5	+ 0·7	+ 1·1	+ 1·1	+ 0·2	+ 0·3	+ 0·1	+ 0·3	− 0·3	− 0·7	− 1·0	0·0
10 "	+ 1·0	+ 1·7	+ 2·5	+ 2·2	+ 2·2	+ 1·3	+ 0·8	+ 0·8	+ 1·0	+ 0·9	+ 1·3	+ 1·3	+ 1·4
11 "	+ 2·9	+ 3·7	+ 3·8	+ 3·4	+ 3·3	+ 1·5	+ 1·3	+ 1·2	+ 1·9	+ 2·4	+ 3·2	+ 2·9	+ 2·6
NOON.	+ 5·3	+ 5·0	+ 5·0	+ 4·1	+ 4·0	+ 2·1	+ 1·8	+ 1·7	+ 2·6	+ 3·7	+ 5·1	+ 4·9	+ 3·8
1 P.M.	+ 6·6	+ 6·2	+ 5·6	+ 4·8	+ 4·6	+ 3·0	+ 2·4	+ 1·9	+ 3·1	+ 4·6	+ 6·4	+ 6·4	+ 4·6
2 "	+ 7·0	+ 7·9	+ 5·7	+ 5·1	+ 4·8	+ 3·1	+ 2·1	+ 2·3	+ 3·1	+ 5·1	+ 6·7	+ 7·2	+ 5·0
3 "	+ 7·0	+ 7·0	+ 5·4	+ 4·7	+ 4·6	+ 3·1	+ 2·0	+ 2·3	+ 3·1	+ 5·4	+ 6·5	+ 7·1	+ 4·8
4 "	+ 6·5	+ 6·5	+ 4·9	+ 4·1	+ 3·8	+ 2·6	+ 1·8	+ 1·7	+ 2·8	+ 4·7	+ 5·6	+ 6·4	+ 4·3
5 "	+ 3·9	+ 4·7	+ 3·6	+ 2·9	+ 2·7	+ 1·7	+ 0·9	+ 1·0	+ 1·6	+ 3·1	+ 3·2	+ 3·5	+ 2·7
6 "	+ 2·0	+ 1·9	+ 1·2	+ 0·7	+ 0·8	+ 0·5	+ 0·3	+ 0·1	+ 0·3	+ 1·2	+ 1·5	+ 1·9	+ 1·0
7 "	+ 1·0	+ 0·7	+ 0·1	− 0·6	− 0·7	− 0·4	− 0·3	− 0·4	− 0·2	+ 0·3	+ 0·7	+ 1·0	+ 0·1
8 "	+ 0·2	+ 0·1	− 0·4	− 1·1	− 1·2	− 0·8	− 0·5	− 0·5	− 0·5	− 0·6	− 0·1	+ 0·4	− 0·4
9 "	− 0·6	− 0·6	− 1·0	− 1·4	− 1·6	− 1·2	− 0·7	− 0·6	− 0·9	− 1·3	− 1·0	− 0·5	− 0·9
10 "	− 1·5	− 1·6	− 1·5	− 1·8	− 1·9	− 1·4	− 0·7	− 0·6	− 1·1	− 1·8	− 1·9	− 1·6	− 1·4
11 "	− 2·5	− 2·3	− 2·1	− 1·9	− 2·3	− 1·3	− 0·9	− 0·9	− 1·2	− 2·2	− 2·6	− 2·4	− 1·9

Mean of the hours from 9 P.M. to 8 A.M. .... 76°·3 } Difference = 5°·0
Mean of the hours from 9 A.M. to 8 P.M. .... 81·3 }

Mean of 24 hours .... 78·8

In the Mean Diurnal Variation for the year a Maximum occurs at 2 P.M., and a Minimum at 6 A.M.

Temperature of the Ground, 1867.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1867. MONTH.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.
	°	°	°	°	°	°	°	°
January	75·1	− 4·6	76·0	− 4·1	79·0	− 3·1	81·7	− 1·5
February	74·0	− 5·7	74·9	− 5·2	78·0	− 4·1	81·0	− 2·2
March	77·7	− 2·0	77·5	− 2·6	79·0	− 3·1	81·0	− 2·2
April	81·2	+ 1·5	80·8	+ 0·7	82·0	− 0·1	82·3	− 0·9
May	85·4	+ 5·7	84·3	+ 4·2	84·7	+ 2·6	83·6	+ 0·4
June	85·6	+ 5·9	85·6	+ 5·5	86·4	+ 4·3	85·7	+ 2·5
July	81·6	+ 1·9	82·7	+ 2·6	84·9	+ 2·8	85·7	+ 2·5
August	80·9	+ 1·2	81·6	+ 1·5	83·6	+ 1·5	84·5	+ 1·3
September	80·8	+ 1·1	81·3	+ 1·2	83·2	+ 1·1	84·1	+ 0·9
October	80·8	+ 1·1	81·0	+ 0·9	83·0	+ 0·9	83·8	+ 0·6
November	77·6	− 2·1	78·5	− 1·6	81·2	− 0·9	83·2	0·0
December	75·9	− 3·8	77·0	− 3·1	79·7	− 2·4	82·2	− 1·0

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to April, November and December	76·9	77·4	79·8	81·9
Do. of May to October	82·5	82·7	84·3	84·6
Do. of Year	79·7	80·1	82·1	83·2
Greatest monthly mean (that of June)	85·6	85·6	86·4	......
Do. do. (that of June or July)	......	......	......	85·7
Least monthly mean (that of February)	74·0	74·9	78·0	......
Do. do. (that of February or March)	......	......	......	81·0
Difference	11·6	10·7	8·4	4·7

Temperature of the Ground, 1867.

TABLE VI.—*Showing, for each Hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine inches respectively below the surface, and its Mean Diurnal Variation for the Year.*

1867. Bombay Civil Time.	DEPTH.			
	1 Inch.		9 Inches.	
	Mean Temperature.	Excess over the mean of 24 hours.	Mean Temperature.	Excess over the mean of 24 hours.
	°	°	°	°
Midnight.	78·3	− 1·4	80·1	0·0
1 A.M.	78·1	− 1·6	80·1	0·0
2 „	77·8	− 1·9	80·0	− 0·1
3 „	77·6	− 2·1	80·0	− 0·1
4 „	77·3	− 2·4	79·9	− 0·2
5 „	77·1	− 2·6	79·9	− 0·2
6 „	76·9	− 2·8	79·8	− 0·3
7 „	77·3	− 2·4	79·7	− 0·4
8 „	78·4	− 1·3	79·8	− 0·3
9 „	79·4	− 0·3	79·8	− 0·3
10 „	80·3	+ 0·6	79·9	− 0·2
11 „	81·2	+ 1·5	80·0	− 0·1
Noon.	82·0	+ 2·3	80·1	0·0
1 P.M.	82·7	+ 3·0	80.2	+ 0·1
2 „	83·0	+ 3·3	80·3	+ 0·2
3 „	83·1	+ 3·4	80·4	+ 0·3
4 „	82·8	+ 3·1	80·5	+ 0·4
5 „	82·0	+ 2·3	80·5	+ 0·4
6 „	80·9	+ 1·2	80·4	+ 0·3
7 „	80·2	+ 0·5	80·4	+ 0·3
8 „	79·8	+ 0·1	80·3	+ 0·2
9 „	79·3	− 0·4	80·3	+ 0·2
10 „	78·9	− 0·8	80·2	+ 0·1
11 „	78·6	− 1·1	80·2	+ 0·1

	DEPTH.	
	1 Inch.	9 Inches.
	°	°
Mean of hours from 10 P.M. to 9 A.M.	78·0	......
Ditto 10 A.M. to 9 P.M.	81·4	......
Ditto 1 A.M. to Noon	......	79·9
Ditto 1 P.M. to Midnight	......	80·3
Mean of 24 hours	79·7	80·1
Maximum at 3 P.M.	83·1	......
Ditto 4 or 5 P.M.	......	80·5
Minimum at 6 A.M.	76·9	......
Ditto 7 A.M.	......	79·7
Difference	6·2	0·8

Temperature of Evaporation, 1867.

TABLE VII.—*Mean Temperature of Evaporation for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1867.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	66·3	70·1	74·8	78·6	78·9	79·0	77·7	...	76·2	71·7	...
2	68·3	67·7	69·9	74·2	79·6	...	78·5	77·7	76·9	76·1	69·2	70·4
3	68·8	...	...	74·4	79·3	80·3	79·4	77·4	76·8	77·4	...	70·4
4	67·4	61·3	...	74·5	78·9	80·3	76·8	...	76·8	76·8	71·6	69·6
5	66·3	61·6	69·8	75·8	...	80·3	75·7	77·6	76·7	75·7	72·7	69·4
6	...	61·5	68·6	75·0	78·6	80·1	77·2	77·7	77·2	...	72·0	68·9
7	65·6	64·1	70·2	...	78·9	79·9	...	76·8	77·2	77·6	72·8	69·0
8	63·6	65·4	71·2	75·0	78·8	80·1	77·9	77·9	...	77·9	74·2	...
9	65·0	66·9	71·5	75·7	79·2	...	77·6	77·5	77·4	76·0	69·9	69·6
10	67·0	...	...	74·2	79·4	78·5	77·9	75·6	77·6	77·5	...	71·1
11	67·9	69·8	72·5	72·4	79·8	80·5	77·3	...	77·3	74·2	68·3	71·0
12	68·7	66·0	72·5	73·3	...	80·2	78·2	77·1	77·5	75·8	68·2	71·5
13	...	63·9	72·9	76·0	79·9	80·5	78·2	76·8	77·3	...	67·2	71·7
14	69·4	64·9	72·4	...	80·5	79·9	...	...	77·0	72·9	67·3	72·6
15	69·2	67·6	72·1	73·7	79·9	79·9	75·7	76·1	...	76·9	67·9	...
16	68·7	66·9	72·6	74·1	75·4	...	74·6	77·3	76·1	76·4	69·1	70·7
17	69·4	...	...	75·1	74·9	78·6	75·9	76·5	76·5	77·7	...	68·6
18	69·7	69·1	72·4	75·1	76·8	80·4	75·9	...	76·5	77·5	69·2	67·6
19	69·2	66·6	...	...	...	80·1	77·3	77·0	76·3	75·0	70·4	69·5
20	...	61·8	72·5	73·4	77·6	79·4	78·2	77·2	76·6	...	70·1	70·6
21	72·8	62·5	71·9	...	77·6	77·6	...	76·8	75·4	76·9	69·7	69·1
22	69·4	63·4	73·5	76·2	78·2	77·3	78·2	78·0	...	77·6	69·4	...
23	65·9	65·7	72·6	77·3	78·4	...	78·1	77·3	75·1	77·6	69·3	68·8
24	65·8	...	...	76·6	...	78·9	78·6	77·4	73·6	77·5	...	68·8
25	61·5	68·5	71·1	76·7	77·2	79·1	77·8	...	75·3	75·5	69·9	...
26	62·6	69·2	71·6	77·5	...	79·2	76·5	76·9	75·6	75·5	70·4	62·7
27	...	69·6	72·6	77·7	78·0	78·4	76·3	76·9	76·0	...	69·7	63·1
28	70·0	69·8	70·8	...	79·7	77·7	...	76·2	75·7	...	69·9	66·7
29	69·8		72·2	76·6	79·5	79·0	77·5	76·9	...	72·4	66·8	...
30	65·9		74·3	77·0	79·4	...	78·2	77·0	75·3	74·4	69·4	66·9
31	62·7		...		79·5		78·4	77·3		75·4		66·6
Monthly Mean.	67·3	65·8	71·7	75·3	78·6	79·4	77·5	77·1	76·4	76·1	69·9	69·0
Annual Variation.	− 6·4	− 7·9	− 2·0	+ 1·6	+ 4·9	+ 5·7	+ 3·8	+ 3·4	+ 2·7	+ 2·4	− 3·8	− 4·7

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Mean of months from January to April, November and December	69·8
Mean of months from May to October	77·5
Mean for the Year..	73·7
The greatest monthly mean (that of June)	79·4
The least monthly mean (that of February)	65·8
Difference	13·6

Temperature of Evaporation, 1867.

TABLE VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1867.	MONTH.												Year.
Bombay Civil Time.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 0·9	− 1·0	− 0·5	− 0·7	− 0·7	− 0·4	− 0·4	− 0·6	− 0·8	− 1·2	− 1·0	− 1·1	− 0·8
1 A.M.	− 1·1	− 1·2	− 0·5	− 0·8	− 0·9	− 0·5	− 0·7	− 0·5	− 0·9	− 1·4	− 1·4	− 1·5	− 0·9
2 „	− 1·2	− 1·4	− 0·5	− 1·0	− 1·1	− 0·3	− 0·7	− 0·6	− 1·0	− 1·2	− 1·7	− 1·6	− 1·0
3 „	− 1·8	− 1·8	− 0·9	− 1·2	− 1·3	− 0·6	− 0·9	− 0·9	− 1·1	− 1·4	− 1·8	− 2·0	− 1·3
4 „	− 2·3	− 2·3	− 1·4	− 1·7	− 1·3	− 0·7	− 0·9	− 1·0	− 1·1	− 1·7	− 2·3	− 2·2	− 1·6
5 „	− 2·6	− 2·9	− 2·4	− 1·9	− 1·3	− 0·9	− 1·1	− 1·3	− 1·2	− 1·6	− 2·6	− 2·7	− 1·9
6 „	− 3·0	− 4·0	− 3·0	− 1·9	− 1·2	− 0·8	− 0·9	− 1·0	− 1·2	− 1·7	− 2·6	− 3·4	− 2·1
7 „	− 2·8	− 4·0	− 2·7	− 1·1	− 0·7	− 0·7	− 0·6	− 0·6	− 0·8	− 0·9	− 2·2	− 2·9	− 1·7
8 „	− 1·8	− 2·7	− 1·6	− 0·4	− 0·2	− 0·4	− 0·1	− 0·2	0·0	− 0·5	− 1·7	− 1·4	− 0·9
9 „	− 1·3	− 1·7	− 0·9	+ 0·2	+ 0·3	0·0	+ 0·3	+ 0·2	+ 0·7	0·0	− 1·3	− 0·8	− 0·4
10 „	− 0·7	− 0·7	0·0	+ 0·5	+ 0·4	+ 0·6	+ 0·6	+ 0·7	+ 1·0	+ 0·2	− 0·4	− 0·4	+ 0·1
11 „	− 0·1	+ 0·5	+ 0·8	+ 1·1	+ 0·7	+ 0·5	+ 0·9	+ 0·9	+ 1·3	+ 0·7	− 0·3	0·0	+ 0·6
Noon.	+ 0·8	+ 1·8	+ 1·3	+ 1·4	+ 1·1	+ 1·0	+ 1·1	+ 1·3	+ 1·6	+ 1·1	+ 0·5	+ 0·7	+ 1·1
1 P.M.	+ 1·9	+ 2·8	+ 2·2	+ 1·8	+ 1·2	+ 1·1	+ 1·3	+ 1·3	+ 1·6	+ 1·8	+ 1·7	+ 1·7	+ 1·7
2 „	+ 3·1	+ 3·6	+ 2·7	+ 2·0	+ 1·6	+ 1·2	+ 1·1	+ 1·4	+ 1·5	+ 2·1	+ 2·8	+ 2·8	+ 2·2
3 „	+ 3·5	+ 3·9	+ 2·6	+ 1·8	+ 1·5	+ 1·3	+ 1·1	+ 1·2	+ 1·5	+ 2·1	+ 3·1	+ 3·2	+ 2·2
4 „	+ 3·5	+ 3·8	+ 2·4	+ 1·5	+ 1·2	+ 1·0	+ 0·9	+ 0·8	+ 1·1	+ 2·2	+ 2·8	+ 3·4	+ 2·0
5 „	+ 3·0	+ 3·1	+ 1·9	+ 1·1	+ 1·1	+ 0·5	+ 0·2	+ 0·4	+ 0·3	+ 1·4	+ 2·1	+ 2·6	+ 1·5
6 „	+ 2·1	+ 2·1	+ 0·8	+ 0·2	+ 0·7	+ 0·1	− 0·2	0·0	− 0·1	+ 0·8	+ 1·9	+ 2·1	+ 0·9
7 „	+ 1·6	+ 1·9	+ 0·5	− 0·2	+ 0·2	− 0·3	− 0·2	− 0·3	− 0·3	+ 0·6	+ 2·0	+ 1·7	+ 0·6
8 „	+ 1·2	+ 1·5	+ 0·3	− 0·1	− 0·1	− 0·4	− 0·3	− 0·3	− 0·5	+ 0·2	+ 1·8	+ 1·7	+ 0·4
9 „	+ 0·7	+ 1·9	+ 0·1	− 0·2	− 0·2	− 0·5	− 0·4	− 0·3	− 0·5	− 0·3	+ 0·9	+ 0·7	+ 0·2
10 „	− 0·2	− 0·1	− 0·1	− 0·2	− 0·3	− 0·4	− 0·5	− 0·3	− 0·7	− 0·6	− 0·3	− 0·2	− 0·3
11 „	− 1·1	− 1·1	− 0·3	− 0·4	− 0·4	− 0·3	− 0·5	− 0·4	− 0·8	− 0·8	− 0·9	− 0·5	− 0·6

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Mean of the hours from 10 P.M. to 9 A.M.	72·6
Mean of the hours from 10 A.M. to 9 P.M.	74·8
Mean of 24 hours	73·7

In the Mean Diurnal Variation for the year a Maximum occurs between 2 and 3 P.M., and a Minimum at 6 A.M.

Temperature of Dew-point, 1867.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1867. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	62·3	67·2	73·2	77·1	76·3	77·3	76·5	...	75·1	69·0	...
2	66·1	64·8	67·9	72·2	78·1	...	77·2	76·2	75·5	75·4	65·1	68·0
3	66·6	...	...	72·6	77·5	78·1	77·9	76·6	75·8	76·5	...	67·7
4	64·3	54·3	...	72·2	77·2	77·9	76·2	...	75·6	75·9	69·1	66·2
5	62·7	55·5	67·6	74·1	...	78·0	75·2	76·4	75·6	74·6	70·2	66·7
6	...	55·5	65·1	72·9	76·9	78·0	76·5	76·6	76·2	...	68·2	65·6
7	62·1	60·1	66·7	...	77·1	77·5	...	76·1	76·0	76·3	69·6	65·4
8	59·0	62·0	69·0	73·2	76·9	77·7	76·2	76·9	...	76·5	71·5	...
9	61·0	63·6	69·9	74·0	77·6	...	75·8	76·5	76·2	74·3	65·2	66·2
10	63·2	...	...	72·1	77·6	76·8	76·1	75·0	76·2	73·5	...	68·2
11	64·3	68·1	70·7	69·5	77·9	78·9	75·8	...	75·7	72·1	64·8	68·6
12	65·1	62·1	70·7	70·4	...	78·4	76·7	75·9	76·2	73·9	65·0	69·6
13	...	58·0	71·0	74·5	78·2	78·7	77·4	76·3	76·1	...	63·3	70·0
14	66·5	60·3	70·1	...	78·7	78·7	...	...	75·6	69·2	63·0	71·0
15	66·3	63·8	70·1	71·2	77·9	78·2	75·1	75·6	...	76·2	64·4	...
16	65·2	62·3	71·1	71·6	72·0	...	74·2	76·5	74·4	75·6	66·2	68·7
17	66·1	...	...	73·2	71·9	77·1	75·6	76·1	75·5	76·9	...	65·6
18	66·8	66·4	70·7	73·3	74·3	78·7	75·5	...	75·4	76·2	66·8	64·3
19	66·1	64·0	...	...	...	78·0	76·7	76·2	74·6	72·9	68·2	66·9
20	...	56·7	70·5	70·4	75·5	77·1	77·1	76·1	75·4	...	67·5	68·4
21	71·3	57·9	69·9	...	75·2	75·3	...	75·9	74·5	76·4	66·9	66·3
22	67·1	59·4	71·8	74·3	75·8	76·3	77·1	77·2	...	76·7	65·7	...
23	61·9	62·4	70·6	75·7	75·9	...	77·2	76·4	73·8	76·8	65·4	66·5
24	61·7	...	...	73·7	...	77·7	77·5	76·2	73·0	75·8	...	66·7
25	54·6	65·6	68·4	74·8	74·2	78·0	76·5	...	74·2	73·2	66·3	...
26	56·6	65·8	68·9	75·9	...	77·4	75·4	76·1	74·2	73·8	67·1	57·3
27	...	65·8	70·2	75·9	75·3	77·2	75·6	76·0	74·8	...	66·6	59·0
28	67·8	66·2	67·4	...	77·5	76·7	...	75·4	74·6	...	66·9	63·5
29	67·5		69·3	74·7	77·1	77·5	76·3	76·0	...	70·2	64·3	...
30	61·3		72·1	75·2	77·0	...	77·0	76·1	74·2	72·9	66·9	63·8
31	56·1		...		77·2		77·3	76·0		73·7		63·1
Monthly Mean.	63·8	61·8	69·5	73·2	76·4	77·6	76·4	76·2	75·2	74·6	66·7	66·1
Annual Variation.	− 7·7	− 9·7	− 2·0	+ 1·7	+ 4·9	+ 6·1	+ 4·9	+ 4·7	+ 3·7	+ 3·1	− 4·8	− 5·4

	°
Mean of months from January to April, November and December	66·8
Mean of months from May to October	76·1
Mean for the Year	71·5
The greatest monthly mean (that of June)	77·6
The least monthly mean (that of February)	61·8
Difference	15·8

Temperature of Dew-point, 1867.

TABLE X.—*The Mean Diurnal Variation of the Temperature of Dew-point for each Month, and for the whole Year; or the Excess of the Mean Temperature of Dew-point above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	0·0	0·0	+ 0·4	0·0	0·0	0·0	− 0·4	− 0·5	− 0·6	− 0·7	0·0	− 0·3	− 0·2
1 A.M.	− 0·1	− 0·4	+ 0·5	0·0	− 0·2	− 0·1	− 0·6	− 0·5	− 0·9	− 1·0	− 0·5	− 0·7	− 0·4
2 "	0·0	− 0·4	+ 0·6	− 0·2	− 0·4	− 0·1	− 0·5	− 0·5	− 0·7	− 0·7	− 1·0	− 0·6	− 0·4
3 "	− 0·7	− 0·9	+ 0·2	− 0·4	− 0·6	− 0·1	− 0·7	− 0·8	− 0·8	− 0·8	− 1·0	− 0·9	− 0·6
4 "	− 1·3	− 1·3	− 0·3	− 0·9	− 0·6	− 0·2	− 0·6	− 0·9	− 0·8	− 1·1	− 1·6	− 1·1	− 0·9
5 "	− 1·8	− 1·8	− 1·4	− 1·1	− 0·5	− 0·5	− 0·8	− 1·1	− 0·8	− 1·0	− 1·8	− 1·7	− 1·2
6 "	− 2·2	− 3·4	− 2·2	− 1·0	− 0·4	− 0·3	− 0·6	− 0·8	− 0·8	− 1·0	− 1·6	− 2·6	− 1·4
7 "	− 2·0	− 3·4	− 2·2	− 0·6	− 0·3	− 0·5	− 0·4	− 0·4	− 0·5	− 0·2	− 1·5	− 1·8	− 1·1
8 "	− 1·2	− 2·7	− 1·9	− 0·4	− 0·3	− 0·3	+ 0·1	− 0·1	+ 0·2	− 0·2	− 1·5	− 0·7	− 0·7
9 "	− 1·8	− 2·7	− 1·9	− 0·2	0·0	− 0·1	+ 0·4	+ 0·2	+ 0·9	+ 0·2	− 1·7	− 0·9	− 0·6
10 "	− 1·9	− 2·4	− 1·3	− 0·2	− 0·2	+ 0·4	+ 0·5	+ 0·7	+ 1·0	0·0	− 1·3	− 1·3	− 0·5
11 "	− 2·1	− 1·5	− 0·6	+ 0·4	− 0·3	+ 0·2	+ 0·7	+ 0·7	+ 1·2	+ 0·2	− 2·2	− 1·5	− 0·4
Noon.	− 1·8	− 0·1	− 0·4	+ 0·4	0·0	+ 0·5	+ 0·5	+ 1·1	+ 1·3	+ 0·1	− 1·8	− 1·4	− 0·1
1 P.M.	− 0·4	+ 1·1	+ 0·9	+ 0·8	+ 0·1	+ 0·5	+ 1·0	+ 1·1	+ 1·2	+ 0·9	− 0·3	− 0·7	+ 0·5
2 "	+ 1·4	+ 2·2	+ 1·3	+ 1·0	+ 0·6	+ 0·6	+ 0·9	+ 1·1	+ 0·9	+ 1·1	+ 1·2	+ 0·9	+ 1·1
3 "	+ 2·1	+ 2·7	+ 1·5	+ 0·8	+ 0·5	+ 0·7	+ 0·9	+ 0·8	+ 0·9	+ 1·0	+ 1·8	+ 1·7	+ 1·3
4 "	+ 2·4	+ 2·8	+ 1·3	+ 0·6	+ 0·4	+ 0·5	+ 0·7	+ 0·5	+ 0·4	+ 1·5	+ 1·9	+ 2·3	+ 1·3
5 "	+ 2·7	+ 2·7	+ 1·1	+ 0·4	+ 0·7	+ 0·1	+ 0·4	+ 0·2	− 0·2	+ 0·8	+ 1·7	+ 2·5	+ 1·1
6 "	+ 2·5	+ 2·4	+ 0·7	0·0	+ 0·7	0·0	− 0·3	− 0·1	− 0·2	+ 0·8	+ 2·2	+ 2·5	+ 0·9
7 "	+ 2·0	+ 2·7	+ 0·6	0·0	+ 0·6	− 0·2	− 0·2	− 0·3	− 0·3	+ 0·8	+ 2·8	+ 2·3	+ 0·9
8 "	+ 1·7	+ 2·3	+ 0·5	+ 0·3	+ 0·3	− 0·4	− 0·3	− 0·2	− 0·5	+ 0·5	+ 2·9	+ 2·5	+ 0·8
9 "	+ 1·4	+ 1·8	+ 0·5	+ 0·3	+ 0·3	− 0·3	− 0·3	− 0·3	− 0·4	+ 0·2	+ 1·9	+ 1·3	+ 0·5
10 "	+ 0·4	+ 0·6	+ 0·5	+ 0·4	+ 0·2	− 0·1	− 0·3	− 0·3	− 0·6	− 0·1	+ 0·5	+ 0·5	+ 0·1
11 "	− 0·4	− 0·5	+ 0·4	+ 0·2	+ 0·3	0·0	− 0·4	− 0·3	− 0·7	− 0·2	0·0	+ 0·4	− 0·1

Mean of the hours from Midnight to 11 A.M.	70·8
Mean of the hours from Noon to 11 P.M.......................	72·2
Mean of 24 hours..	71·5

In the Mean Diurnal Variation for the year a Maximum occurs between 3 and 4 P.M., and a Minimum at 6 A.M.

Maxima and Minima of different Meteorological Elements, 1867.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1867, *which showed the greatest and the least values of the following elements, viz., Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1867. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	°	°	°	°	°	°	°	°	°
January	30·070	29·855	0·215	85·6	62·7	22·9	76·1	54·8	21·3	74·6	44·6	30·0
February	·045	·786	·259	83·7	62·6	21·1	74·8	55·3	19·5	71·6	43·4	28·2
March	·014	·737	·277	88·2	68·1	20·1	77·4	62·4	15·0	74·6	57·3	17·3
April	29·944	·676	·268	91·1	74·3	16·8	79·9	70·3	9·6	77·8	67·1	10·7
May...........	·848	·630	·218	91·3	77·9	13·4	82·5	71·7	10·8	80·4	69·0	11·4
June............	·855	·514	·341	92·6	75·7	16·9	82·6	72·5	10·1	80·7	73·5	7·2
July............	·847	·523	·324	87·8	73·8	14·0	81·4	70·9	10·5	80·0	69·0	11·0
August.........	·802	·568	·234	85·6	75·4	10·2	80·5	74·2	6·3	79·2	73·1	6·1
September ...	·936	·576	·360	85·9	73·3	12·6	80·4	71·8	8·6	78·7	70·8	7·9
October	·957	·696	·261	89·5	73·4	16·1	81·5	67·2	14·3	80·2	60·3	19·9
November ...	30·143	·819	·324	88·4	67·9	20·5	79·2	62·4	16·8	76·1	56·6	19·5
December ...	·091	·864	·227	86·0	61·8	24·2	76·2	55·0	21·2	73·7	49·5	24·2
Year...........	30·143	29·514	0·629	92·6	61·8	30·8	82·6	54·8	27·8	80·7	43·4	37·3

Pressure of Vapour, 1867.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time: also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1867. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·570	0·671	0·817	0·931	0·907	0·937	0·911	...	0·871	0·711	...
2	0·642	·615	·682	·791	·962	...	·935	·904	0·883	·879	·623	0·687
3	·652	...	...	·799	·943	·960	·957	·914	·892	·914	...	·680
4	·603	·428	...	·791	·933	·956	·903	...	·886	·896	·712	·646
5	·571	·441	·676	·844	...	·957	·873	·910	·885	·855	·740	·657
6	...	·449	·622	·809	·923	·957	·912	·915	·904	...	·692	·631
7	·558	·525	·661	...	·930	·943	...	·901	·900	·908	·725	·627
8	·500	·559	·710	·817	·924	·950	·905	·925	...	·912	·774	...
9	·540	·596	·730	·841	·945	...	·893	·913	·902	·843	·627	·646
10	·585	...	...	·788	·947	·921	·900	·867	·903	·827	...	·694
11	·605	·686	·754	·721	·956	·987	·892	...	·887	·789	·617	·700
12	·621	·561	·755	·744	...	·972	·918	·895	·904	·839	·618	·723
13	...	·488	·764	·854	·964	·982	·939	·905	·901	...	·584	·733
14	·649	·532	·735	...	·981	·981	...	...	·883	·725	·578	·758
15	·646	·600	·736	·764	·957	·965	·871	·884	...	·903	·607	...
16	·624	·564	·761	·776	·784	...	·846	·911	·851	·887	·644	·702
17	·645	...	...	·816	·784	·934	·885	·899	·882	·924	...	·632
18	·658	·649	·750	·819	·849	·979	·882	...	·880	·904	·662	·608
19	·644	·599	...	...	...	·959	·918	·903	·858	·812	·690	·661
20	...	·462	·745	·744	·884	·929	·930	·900	·879	...	·674	·695
21	·767	·484	·730	...	·874	·875	...	·894	·852	·911	·659	·646
22	·664	·510	·781	·846	·890	·908	·932	·934	...	·919	·636	...
23	·555	·565	·748	·888	·893	...	·932	·908	·834	·922	·628	·651
24	·551	...	...	·833	...	·949	·942	·905	·811	·893	...	·654
25	·431	·633	·695	·862	·846	·960	·912	...	·845	·818	·649	...
26	·468	·638	·711	·893	...	·953	·880	·900	·845	·833	·666	·471
27	...	·636	·741	·894	·876	·934	·885	·898	·863	...	·652	·508
28	·681	·647	·671	...	·941	·919	...	·880	·856	...	·660	·593
29	·676		·717	·860	·930	·945	·908	·896	...	·738	·602	...
30	·544		·789	·873	·928	...	·928	·900	·845	·810	·661	·594
31	·461		...		·935		·935	·897		·830		·583
Monthly Mean.	0·598	0·560	0·722	0·819	0·912	0·947	0·909	0·903	0·873	0·860	0·657	0·647
Annual Variation.	—·186	—·224	—·062	+·035	+·128	+·163	+·125	+·119	+·089	+·076	—·127	—·137

	in.
Mean of months from January to April, November and December	0·667
Mean of months from May to October	0·901
Mean for the Year	0·784
The greatest monthly mean (that of June)	0·947
The least monthly mean (that of February)	0·560
Difference	0·387

Pressure of Vapour, 1867.

TABLE XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·001	−0·002	+0·009	0·000	−0·002	−0·002	−0·012	−0·014	−0·017	−0·021	0·000	−0·009	−0·006
1 A.M.	− ·001	− ·008	+ ·012	− ·001	− ·007	− ·005	− ·018	− ·012	− ·024	− ·028	− ·013	− ·016	− ·010
2 „	+ ·001	− ·007	+ ·015	− ·007	− ·013	+ ·004	− ·015	− ·015	− ·021	− ·019	− ·022	− ·015	− ·010
3 „	− ·014	− ·017	+ ·009	− ·012	− ·018	− ·004	− ·022	− ·023	− ·022	− ·023	− ·022	− ·020	− ·016
4 „	− ·026	− ·026	− ·007	− ·025	− ·019	− ·008	− ·016	− ·026	− ·022	− ·031	− ·035	− ·024	− ·022
5 „	− ·033	− ·034	− ·033	− ·030	− ·017	− ·015	− ·023	− ·033	− ·023	− ·028	− ·040	− ·036	− ·029
6 „	− ·041	− ·063	− ·051	− ·029	− ·015	− ·010	− ·017	− ·023	− ·023	− ·030	− ·037	− ·056	− ·033
7 „	− ·036	− ·063	− ·050	− ·016	− ·012	− ·015	− ·011	− ·012	− ·013	− ·007	− ·034	− ·040	− ·025
8 „	− ·022	− ·052	− ·044	− ·011	− ·009	− ·011	+ ·003	− ·004	+ ·002	− ·005	− ·034	− ·017	− ·017
9 „	− ·034	− ·052	− ·043	− ·005	− ·001	− ·004	+ ·012	+ ·006	+ ·026	+ ·003	− ·037	− ·019	− ·012
10 „	− ·037	− ·048	− ·028	− ·005	− ·006	+ ·013	+ ·017	+ ·022	+ ·032	− ·003	− ·028	− ·029	− ·008
11 „	− ·041	− ·026	− ·013	+ ·009	− ·009	+ ·007	+ ·023	+ ·025	+ ·036	+ ·004	− ·046	− ·036	− ·006
Noon.	− ·035	+ ·001	− ·007	+ ·011	− ·001	+ ·017	+ ·026	+ ·035	+ ·039	+ ·003	− ·038	− ·032	+ ·002
1 P.M.	− ·009	+ ·022	+ ·022	+ ·021	+ ·002	+ ·016	+ ·031	+ ·033	+ ·037	+ ·024	− ·007	− ·013	+ ·015
2 „	+ ·026	+ ·043	+ ·037	+ ·027	+ ·016	+ ·020	+ ·026	+ ·035	+ ·028	+ ·029	+ ·029	+ ·018	+ ·028
3 „	+ ·043	+ ·052	+ ·038	+ ·021	+ ·014	+ ·023	+ ·028	+ ·023	+ ·028	+ ·029	+ ·043	+ ·037	+ ·032
4 „	+ ·050	+ ·054	+ ·033	+ ·017	+ ·009	+ ·017	+ ·022	+ ·015	+ ·012	+ ·042	+ ·045	+ ·053	+ ·031
5 „	+ ·058	+ ·051	+ ·028	+ ·012	+ ·018	+ ·002	+ ·001	+ ·006	− ·003	+ ·022	+ ·042	+ ·054	+ ·024
6 „	+ ·049	+ ·046	+ ·016	− ·001	+ ·019	− ·001	− ·009	− ·002	− ·007	+ ·020	+ ·053	+ ·054	+ ·020
7 „	+ ·041	+ ·052	+ ·014	− ·002	+ ·017	− ·008	− ·006	− ·009	− ·008	+ ·020	+ ·065	+ ·050	+ ·019
8 „	+ ·035	+ ·044	+ ·013	+ ·008	+ ·009	− ·012	− ·008	− ·008	− ·012	+ ·013	+ ·069	+ ·056	+ ·017
9 „	+ ·026	+ ·033	+ ·013	+ ·009	+ ·008	− ·010	− ·009	− ·009	− ·011	+ ·002	+ ·043	+ ·027	+ ·010
10 „	+ ·006	+ ·010	+ ·013	+ ·011	+ ·006	− ·005	− ·008	− ·009	− ·015	− ·005	+ ·011	+ ·010	+ ·002
11 „	− ·011	− ·013	+ ·011	+ ·007	+ ·009	− ·002	− ·012	− ·009	− ·019	− ·008	− ·001	+ ·006	− ·003

	in.
Mean of the hours from Midnight to 11 A.M.	0·768
Mean of the hours from Noon to 11 P.M.	0·800
Mean of 24 hours	0·784

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M., and a Minimum at 6 A.M.

Relative Humidity of the Air, 1867.

Table XIV.—*Mean Relative Humidity of the Air for each Day of Bombay Civil Time: also the Monthly Mean Relative Humidity and its Variation from the Mean of the Year.*

1867.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	0·683	0·758	0·834	0·828	0·727	0·805	0·855	...	0·872	0·745	...
2	0·797	·748	·811	·800	·833	...	·850	·835	0·858	·914	·667	0·777
3	·794	...	...	·807	·811	·751	·828	·898	·885	·894	...	·757
4	·736	·552	...	·772	·815	·739	·925	...	·862	·896	·757	·722
5	·708	·580	·791	·823	...	·741	·939	·871	·872	·870	·753	·757
6	...	·609	·690	·781	·806	·759	·910	·873	·889	...	·670	·715
7	·711	·687	·711	...	·803	·735	...	·926	·877	·859	·702	·699
8	·651	·719	·797	·804	·793	·738	·811	·883	...	·847	·746	...
9	·688	·726	·834	·826	·815	...	·806	·885	·856	·816	·635	·709
10	·702	...	...	·788	·802	·806	·805	·933	·854	·801	...	·743
11	·703	·834	·831	·722	·791	·813	·831	...	·817	·784	·704	·769
12	·696	·697	·828	·725	...	·799	·826	·866	·855	·809	·729	·811
13	...	·594	·823	·835	·798	·795	·905	·933	·865	...	·693	·823
14	·736	·653	·773	...	·795	·852	...	...	·832	·696	·667	·837
15	·738	·691	·806	·759	·775	·810	·932	·935	...	·920	·707	...
16	·700	·640	·850	·755	·678	...	·951	·916	·820	·914	·742	·808
17	·727	...	...	·801	·704	·835	·951	·944	·887	·906	...	·742
18	·744	·765	·824	·804	·745	·804	·948	...	·879	·854	·778	·722
19	·735	·778	...	...	...	·763	·924	·908	·815	·795	·792	·769
20	...	·637	·794	·724	·776	·746	·874	·875	·866	...	·768	·791
21	·842	·656	·800	...	·748	·748	...	·895	·898	·940	·744	·752
22	·792	·699	·825	·795	·743	·886	·877	·910	...	·892	·694	...
23	·682	·722	·799	·819	·735	...	·887	·893	·857	·908	·682	·786
24	·667	...	...	·720	...	·850	·865	·865	·932	·921	...	·802
25	·545	·742	·755	·795	·705	·879	·849	...	·877	·758	·691	...
26	·592	·705	·759	·818	...	·839	·869	·903	·849	·812	·714	·614
27	...	·681	·772	·806	·716	·860	·914	·894	·865	...	·722	·687
28	·792	·699	·699	...	·756	·885	...	·901	·873	...	·728	·747
29	·792		·726	·793	·746	·832	·868	·885	...	·786	·773	...
30	·653		·786	·806	·741	...	·857	·890	·880	·844	·773	·737
31	·560		...		·749		·866	·855		·822		·719
Monthly Mean.	·711	·687	·785	·788	·769	·800	·877	·893	·865	·847	·722	·752
Annual Variation.	−0·080	−0·104	−0·006	−0·003	−0·022	+0·009	+0·086	+0·102	+0·074	+0·056	−0·069	−0·039

Mean of the months from January to April, November and December	0·741
Mean of the months from May to October	0·842
Mean for the Year	0·791
The greatest monthly mean (that of August)	0·893
The least monthly mean (that of February)	0·687
Difference	0·206

Relative Humidity of the Air, 1867.

TABLE XV.—*The Mean Diurnal Variation of Relative Humidity of the Air for each Month, and for the whole Year; or the Excess of the Mean Relative Humidity above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	+ ·072	+ ·064	+ ·077	+ ·062	+ ·062	+ ·033	+ ·010	+ ·010	+ ·020	+ ·045	+ ·072	+ ·056	+ ·049
1 A.M.	+ ·081	+ ·061	+ ·088	+ ·068	+ ·063	+ ·031	+ ·011	+ ·018	+ ·017	+ ·042	+ ·061	+ ·064	+ ·050
2 "	+ ·091	+ ·073	+ ·099	+ ·071	+ ·063	+ ·045	+ ·018	+ ·018	+ ·030	+ ·055	+ ·056	+ ·080	+ ·058
3 "	+ ·082	+ ·077	+ ·103	+ ·072	+ ·063	+ ·042	+ ·017	+ ·017	+ ·036	+ ·060	+ ·063	+ ·083	+ ·060
4 "	+ ·078	+ ·075	+ ·104	+ ·070	+ ·067	+ ·042	+ ·028	+ ·018	+ ·039	+ ·060	+ ·059	+ ·088	+ ·061
5 "	+ ·075	+ ·082	+ ·093	+ ·074	+ ·075	+ ·040	+ ·028	+ ·018	+ ·037	+ ·064	+ ·060	+ ·082	+ ·061
6 "	+ ·077	+ ·058	+ ·080	+ ·081	+ ·073	+ ·045	+ ·029	+ ·027	+ ·037	+ ·067	+ ·074	+ ·067	+ ·060
7 "	+ ·079	+ ·058	+ ·054	+ ·045	+ ·030	+ ·026	+ ·020	+ ·021	+ ·033	+ ·068	+ ·058	+ ·080	+ ·048
8 "	+ ·047	+ ·009	− ·014	·000	− ·005	+ ·006	+ ·014	+ ·010	+ ·025	+ ·035	+ ·015	+ ·047	+ ·016
9 "	− ·020	− ·053	− ·062	− ·036	− ·027	− ·009	+ ·001	+ ·001	+ ·018	+ ·008	− ·029	− ·006	− ·018
10 "	− ·068	− ·092	− ·092	− ·061	− ·062	− ·024	− ·005	− ·002	+ ·002	− ·031	− ·063	− ·068	− ·047
11 "	− ·111	− ·111	− ·105	− ·079	− ·088	− ·032	− ·013	− ·013	− ·018	− ·061	− ·120	− ·111	− ·072
Noon.	− ·149	− ·108	− ·123	− ·094	− ·096	− ·051	− ·026	− ·015	− ·033	− ·094	− ·146	− ·145	− ·090
1 P.M.	− ·149	− ·107	− ·117	− ·097	− ·106	− ·060	− ·035	− ·023	− ·049	− ·095	− ·143	− ·158	− ·095
2 "	− ·126	− ·101	− ·104	− ·098	− ·099	− ·058	− ·032	− ·031	− ·059	− ·104	− ·117	− ·145	− ·089
3 "	− ·110	− ·093	− ·099	− ·096	− ·092	− ·057	− ·030	− ·044	− ·056	− ·111	− ·103	− ·127	− ·085
4 "	− ·095	− ·082	− ·094	− ·085	− ·079	− ·050	− ·027	− ·034	− ·063	− ·084	− ·083	− ·096	− ·073
5 "	− ·030	− ·046	− ·063	− ·054	− ·048	− ·043	− ·027	− ·023	− ·048	− ·064	− ·034	− ·031	− ·043
6 "	+ ·004	+ ·009	− ·016	− ·024	− ·005	− ·016	− ·019	− ·007	− ·015	− ·017	+ ·015	+ ·010	− ·007
7 "	+ ·018	+ ·044	+ ·009	+ ·010	+ ·028	− ·001	+ ·001	+ ·001	− ·002	+ ·007	+ ·049	+ ·026	+ ·016
8 "	+ ·030	+ ·040	+ ·024	+ ·034	+ ·034	+ ·006	+ ·005	+ ·006	+ ·003	+ ·026	+ ·073	+ ·048	+ ·027
9 "	+ ·041	+ ·054	+ ·038	+ ·042	+ ·046	+ ·021	+ ·008	+ ·003	+ ·013	+ ·036	+ ·068	+ ·039	+ ·034
10 "	+ ·039	+ ·048	+ ·052	+ ·055	+ ·050	+ ·028	+ ·011	+ ·009	+ ·015	+ ·043	+ ·056	+ ·048	+ ·038
11 "	+ ·043	+ ·036	+ ·067	+ ·053	+ ·063	+ ·028	+ ·010	+ ·016	+ ·014	+ ·052	+ ·058	+ ·064	+ ·042

Mean of the hours from 8 A.M. to 7 P.M.	0·742
Mean of the hours from 8 P.M. to 7 A.M.	0·840
Mean of 24 hours	0·791

In the Mean Diurnal Variation for the year a Maximum occurs between 4 and 5 A.M., and a Minimum at 1 P.M.

Extent of Cloudy Sky, 1867.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time: also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1867.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...			1·6	2·2	4·3	6·0	7·6	...	6·7		...
2	0·8		0·5	1·1	4·2	...	8·0	7·7	7·7	6·7		0·1
3	1·5	...	...	1·3	2·7	4·1	7·8	8·0	7·9	5·5	...	
4	2·9		...	2·1	2·1	4·9	8·0	...	7·4	5·5	0·8	0·4
5	0·8	2·4	4·3	4·2	...	4·5	7·8	7·2	6·9	6·2	3·4	3·3
6	...	2·2	2·1	4·8	1·4	5·6	7·1	7·5	6·3	...	5·7	1·0
7	3·5	0·2	3·3	...	1·3	4·7	...	8·0	6·6	4·2	5·6	0·6
8	0·2		1·4		1·2	3·9	5·5	7·7	...	4·3	3·2	...
9	0·3	0·3		1·6	0·3	...	6·2	7·6	5·9	2·7	0·5	1·7
10	1·9	...	...	2·7	3·9	7·2	6·0	7·0	6·1	3·0	...	4·5
11	1·6	1·4	0·9	3·9	5·2	7·6	5·9	...	7·0	2·3		2·1
12	0·4	0·7	2·0	3·0	...	7·4	5·2	6·9	7·3	1·5		2·9
13	...		0·5	3·6	4·1	7·7	7·0	8·0	7·4	...	...	1·6
14	0·3		2·6	...	5·3	8·0	...	...	6·2	7·5		0·7
15	2·3		2·3	2·8	4·7	7·7	8·0	8·0	...	6·9		...
16	0·1		4·7	3·5	1·4	...	8·0	7·7	7·2	6·3		0·3
17		...	...	2·0	1·3	7·7	8·0	8·0	7·5	7·1	...	0·2
18	2·9		4·1	1·5	3·7	7·4	8·0	...	7·4	2·9		
19	0·7	0·8	...	...	...	6·2	8·0	7·4	7·2	6·1		
20	...		5·8	3·0	3·3	4·4	8·0	6·7	6·0	...		
21	0·1		7·3	...	4·1	7·8	...	6·7	6·5	6·1	2·6	
22	0·1	0·4	7·2	2·4	5·1	8·0	7·9	7·5	...	2·6		...
23		0·8	6·9	1·6	4·4	...	7·1	7·8	5·6	1·5	0·3	
24	0·3	...	...	0·3	...	6·8	5·9	6·9	7·3	3·2	...	0·1
25	2·8		0·1	0·8	4·8	8·0	6·8	...	5·4	3·0	2·5	...
26	1·4		0·5	1·8	...	8·0	7·5	7·5	4·8	1·8	4·2	1·2
27	...		0·4	2·4	3·7	7·7	7·4	6·9	4·5	...	5·4	
28	0·3			...	4·1	7·8	...	7·8	5·2	...	7·5	
29	1·4			1·7	3·3	6·6	7·6	7·3	...	0·1	7·6	...
30	1·2		0·4	0·8	2·8	...	7·8	6·2	6·7	1·7	4·1	
31			...		5·3		7·8	5·5		1·9		
Monthly Mean.	1·1	0·4	2·4	2·2	3·3	6·6	7·2	7·3	6·6	4·1	2·1	0·8
Annual Variation.	− 2·6	− 3·3	− 1·3	− 1·5	− 0·4	+ 2·9	+ 3·5	+ 3·6	+ 2·9	+ 0·4	− 1·6	− 2·9

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December.........	1·5
Mean of the months from May to October	5·8
Mean for the Year	3·7
The greatest monthly mean (that of August)	7·3
The least monthly mean (that of February)	0·4
Difference............	6·9

Extent of Cloudy Sky, 1867.

TABLE XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	0·3	0·0	2·2	1·8	4·1	6·5	7·0	7·3	6·5	5·0	1·9	0·8	3·6
1 A.M.	0·4	0·0	2·1	2·2	4·3	6·7	6·7	7·3	6·8	4·7	1·9	0·6	3·6
2 „	0·6	0·0	1·8	2·1	4·6	6·8	6·8	7·1	6·7	4·7	2·0	0·8	3·7
3 „	0·6	0·2	1·9	2·5	4·5	6·9	6·6	6·9	7·0	4·2	1·6	0·5	3·6
4 „	0·4	0·3	2·2	3·7	4·0	6·6	7·0	7·6	6·8	3·7	1·4	0·7	3·7
5 „	0·6	0·4	2·0	4·1	4·1	6·9	6·8	7·5	6·6	4·4	1·8	0·4	3·8
6 „	1·6	0·6	2·7	4·2	4·1	7·2	7·4	7·6	7·0	5·3	2·2	1·0	4·2
7 „	2·6	0·7	2·8	4·2	3·4	7·2	7·4	7·8	7·0	5·7	2·6	1·3	4·4
8 „	2·1	0·6	3·1	3·7	2·8	7·3	7·4	7·9	6·5	5·0	2·4	1·4	4·2
9 „	1·6	0·6	2·8	3·4	2·2	7·2	7·5	7·6	6·6	4·3	2·4	1·4	4·0
10 „	1·5	0·7	2·4	2·2	3·0	6·5	7·4	7·2	6·6	4·1	2·4	1·3	3·8
11 „	1·6	0·7	2·4	1·4	3·0	6·4	7·3	7·3	6·4	3·7	2·3	1·0	3·6
Noon.	1·4	0·5	2·3	1·3	2·8	6·2	7·5	7·2	6·7	3·7	2·4	0·9	3·6
1 P.M.	1·4	0·5	2·1	1·1	2·7	6·0	7·1	7·2	6·4	3·3	2·3	0·9	3·4
2 „	1·3	0·3	2·3	1·2	2·5	6·1	7·4	7·1	6·7	3·3	2·5	1·0	3·5
3 „	1·4	0·4	2·7	0·8	2·3	5·8	7·1	6·9	6·5	3·7	2·4	0·9	3·4
4 „	1·4	0·5	2·6	0·5	3·1	6·2	7·4	7·1	6·6	3·7	2·3	0·8	3·5
5 „	1·5	0·7	3·6	0·8	3·1	6·5	7·6	7·6	6·9	4·1	2·5	1·2	3·8
6 „	1·3	1·0	3·3	1·2	3·3	6·8	7·7	7·7	6·6	4·0	2·5	0·8	3·8
7 „	0·5	0·0	2·0	1·1	3·4	7·1	7·7	7·7	6·6	3·6	1·8	0·6	3·5
8 „	0·3	0·1	1·8	0·8	3·2	6·2	6·8	7·6	6·2	3·6	1·8	0·4	3·2
9 „	0·3	0·1	2·2	1·8	2·6	5·9	7·0	7·0	6·1	3·6	1·9	0·2	3·2
10 „	0·3	0·0	2·3	2·8	2·9	6·0	7·1	6·6	5·7	4·0	1·9	0·5	3·3
11 „	0·3	0·0	1·8	3·5	3·6	6·3	7·1	7·3	6·0	3·9	2·3	0·7	3·6

Rainfall, 1867.

Table XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day and each Month of the year.*

1867. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
						in.	in.	in.	in.	in.		
1										0·09		
2							0·07		0·19	0·99		
3							4·28	0·68	0·20			
4							0·03	0·47	0·10	0·41		
5						0·03	3·88	0·03	0·26	0·04		
6						0·25	1·35	0·01	0·35			
7							0·04	1·30	0·14			
8							0·01	0·12				
9						0·08	0·01	0·08	0·01			
10						0·19	0·01	1·12				
11							0·07	0·42				
12						0·01	0·03	0·13	0·06			
13							1·12	2·53	0·24			
14						0·24	2·08	0·43		0·94		
15						0·03	1·32	1·47		0·33		
16						0·11	5·41	0·55		0·08		
17						0·76	1·84	0·63	0·87			
18						0·04	1·56	0·23	0·64			
19							1·95	0·28	0·07			
20							0·04	0·05	0·15	1·93		
21						0·01	0·83	0·43	0·28	0·26		
22						2·27	0·03	0·11				
23						1·00	0·23	0·04	0·85			
24						0·56	0·05	0·02	0·53			
25						0·13	0·03	0·02	0·19			
26						0·23	0·46	0·43	0·34		0·03	
27						0·97	2·56	0·18	0·09			
28						1·33	0·02	0·20	0·28		0·03	
29						0·45	0·08	0·03	0·96		0·07	
30						0·01		0·12				
31								0·10				
Monthly Total.						8·70	29·39	12·21	6·80	5·07	0·13	
No. of rainy days.						20	28	29	21	9	3	

Total fall of rain in the year .... 62·30 inches.
Total number of rainy days in the year 110
The greatest fall of rain in one month (July) .... 29·39 inches.

No rain fell in the months January to May, and December, nor on any of the days left blank in the above table.

Rainfall, 1867.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
						in.	in.	in.	in.	in.			in.
12 to 1 A.M.						0·42	2·33	0·32	0·19	0·13	0·01		3·40
1 „ 2 „						0·24	0·36	0·17	0·39	0·07	0·02		1·25
2 „ 3 „						0·24	0·33	0·51	0·34	0·01			1·43
3 „ 4 „						0·84	0·86	0·23	0·38	0·12			2·43
4 „ 5 „						0·15	1·83	0·62	0·03				2·63
5 „ 6 „						0·15	0·97	0·17	0·14	0·02			1·45
6 „ 7 „						0·03	0·71	0·04	0·35	0·03			1·16
7 „ 8 „						0·60	1·22	0·06	0·12				2·00
8 „ 9 „						0·32	1·55	0·41	0·17				2·45
9 „ 10 „						0·04	3·23	0·48	0·83				4·58
10 „ 11 „						0·68	1·20	0·77	0·76				3·41
11 „ 12 „						0·49	1·58	1·50	0·34				3·91
12 „ 1 P.M.						0·05	1·00	1·20	0·22	0·10	0·05		2·62
1 „ 2 „						0·30	0·84	0·48	0·07	0·56	0·02		2·27
2 „ 3 „						0·13	2·04	0·67	0·11	0·02			2·97
3 „ 4 „						0·00	0·83	0·29	0·01				1·13
4 „ 5 „						0·10	0·57	0·10	0·04				0·81
5 „ 6 „						0·66	1·20	0·22	0·26	0·08			2·42
6 „ 7 „						0·69	0·81	0·29	0·19	0·17			2·15
7 „ 8 „						0·55	1·10	0·22	0·32	0·32			2·51
8 „ 9 „						0·27	0·61	0·29	0·26	0·84			2·27
9 „ 10 „						0·35	0·68	0·02	0·09	0·18			1·32
10 „ 11 „						0·16	0·80	0·38	0·34	0·36			2·04
11 to 12 „						0·24	0·40	1·44	0·03	0·22			2·33

The above table includes the Rainfall on week-days only.

Rainfall, 1867.

TABLE XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 46 feet above the ground, for each Day and each Month of the Year.*

1867. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
						in.	in.	in.	in.	in.		
1										0·12		
2							0·05		0·17	0·93		
3							0·02	0·69	0·19			
4							4·17	0·43	0·10	0·40		
5						[0·03]	3·68	0·02	0·27	0·04		
6						[0·24]	1·24	0·01	0·33			
7							0·02	1·15	0·14			
8							0·01	0·11				
9						0·07		0·08	0·01			
10						0·16	0·02	1·11				
11						0·01	0·04	0·38				
12							0·02	0·11	0·06			
13							1·08	2·40	0·25			
14						0·23	1·96	0·37		1·06		
15						0·03	1·16	1·37		0·34		
16						0·08	5·49	0·48		0·06		
17						0·77	1·73	0·57	0·82			
18						0·04	1·42	0·19	0·56			
19							1·71	0·26	0·05			
20							0·03	0·05	0·12	1·82		
21						0·01	0·75	0·38	0·29	0·26		
22						2·07	0·02	0·10				
23						0·95	0·23	0·04	0·82			
24						0·52	0·04	0·02	0·48			
25						0·10	0·02	0·02	0·19			
26						0·22	0·42	0·46	0·32		0·02	
27						0·95	2·51	0·16	0·09			
28						1·21	0·01	0·16	0·27		0·01	
29						0·42	0·07	0·03	0·92		0·04	
30						0·01		0·11				
31								0·10				
Monthly Total.						8·12	27·92	11·36	6·45	5·03	0·07	
No. of rainy days.						20	27	29	21	9	3	

The numbers for the 5th and 6th of June, when the Gauge was undergoing alteration, bear the same proportion to the corresponding falls by Newman's Gauge as the total fall in the year by Osler's Gauge bears to the total fall in the year by Newman's Gauge.

Total fall of rain in the year.. 58·95 in.
Total number of rainy days in the year 109
The greatest fall of rain in one month (July).................................. 27·92 in.

No rain fell in the months January to May, and December, nor on any of the days left blank in the above table.

Rainfall, 1867.

Table XXI.—*Total Fall of Rain, as measured by Osler's Gauge, placed 46 feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
						in.	in.	in.	in.	in.	in.		in.
12 to 1 A.M.						0·38	2·05	0·33	0·16	0·11			3·03
1 „ 2 „						0·19	0·29	0·13	0·38	0·07	0·01		1·07
2 „ 3 „						0·21	0·27	0·45	0·31	0·01			1·25
3 „ 4 „						0·64	0·84	0·24	0·34	0·11			2·17
4 „ 5 „						0·06	1·77	0·59	0·03				2·45
5 „ 6 „						0·15	0·91	0·11	0·11	0·02			1·30
6 „ 7 „						0·02	0·65	0·05	0·31	0·03			1·06
7 „ 8 „						0·51	1·18	0·04	0·10				1·83
8 „ 9 „						0·31	1·41	0·34	0·16				2·22
9 „ 10 „						0·05	2·98	0·47	0·78				4·28
10 „ 11 „						0·56	1·06	0·68	0·70				3·00
11 „ 12 „						0·54	1·63	1·36	0·34				3·87
12 to 1 P.M.						0·02	0·95	1·12	0·21	0·08	0·03		2·41
1 „ 2 „						0·26	0·75	0·46	0·04	0·53	0·01		2·05
2 „ 3 „						0·17	2·00	0·64	0·10	0·03			2·94
3 „ 4 „						0·00	0·78	0·23	0·01				1·02
4 „ 5 „						0·08	0·48	0·10	0·03				0·69
5 „ 6 „						0·49	1·06	0·17	0·20	0·07			1·99
6 „ 7 „						0·66	0·79	0·26	0·25	0·18			2·14
7 „ 8 „						0·48	1·05	0·24	0·30	0·31			2·38
8 „ 9 „						0·27	0·62	0·29	0·24	0·88			2·30
9 „ 10 „						0·33	0·66	0·01	0·06	0·17			1·23
10 „ 11 „						0·14	0·67	0·31	0·33	0·37			1·82
11 „ 12 „						0·22	0·33	1·35	0·04	0·24	0·02		2·20

The above Table includes the Rainfall on week-days only.

Mean Daily Velocities of the North and East Components of the Wind, 1867.

TABLE XXII.—*Showing the Mean Velocities of the North or South and East or West Components of the Winds which blew on each Day of the Months June to December* 1867.

In miles per hour.

1867. Date.	MONTH.													
	June.		July.		August.		September.		October.		November.		December.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
1	...	...	3·5 S	15·0 W	2·5 S	21·9 W	1·6 S	14·9 W	2·6 S	4·2 W	8·9 N	2·6 E	8·0 N	0·5 E
2	0·6 S	8·2 W	4·0 S	15·8 W	2·4 S	24·1 W	1·6 S	12·0 W	3·9 S	4·6 W	9·3 N	1·7 W	5·8 N	0·6 W
3	8·9 S	5·3 W	4·8 S	19·7 W	3·7 S	28·2 W	0·3 N	13·5 W	2·6 S	2·1 W	8·5 N	1·4 E	6·1 N	0·1 W
4	9·5 S	7·8 W	3·4 S	12·3 W	0·1 S	22·2 W	8·2 S	11·4 W	7·0 N	1·5 W	8·2 N	3·1 E	4·2 N	0·2 E
5	6·4 S	11·4 W	0·1 N	0·3 W	5·0 S	18·9 W	12·0 S	12·4 W	3·5 N	0·0	9·0 N	1·1 W	7·9 N	0·9 E
6	2·5 N	11·8 W	7·4 S	6·7 W	7·5 S	18·0 W	9·8 S	12·6 W	3·6 N	0·4 W	10·2 N	0·1 E	6·7 N	0·3 W
7	2·4 N	13·3 W	6·6 S	15·9 W	5·7 S	21·9 W	7·0 S	13·2 W	5·3 N	1·6 W	7·4 N	0·5 W	6·7 N	0·7 E
8	0·9 S	12·6 W	5·7 S	14·6 W	1·0 N	16·9 W	4·4 S	12·9 W	8·6 N	2·6 W	8·9 N	1·0 E	6·3 N	2·3 E
9	1·2 N	13·1 W	5·6 S	14·1 W	2·3 N	16·2 W	2·5 N	10·5 W	7·4 N	1·7 W	9·9 N	5·5 E	6·9 N	0·6 E
10	...	...	2·2 S	12·1 W	2·9 S	8·6 W	3·4 N	9·2 W	8·8 N	1·5 W	10·8 N	0·0	7·4 N	1·4 E
11	7·8 N	6·6 W	10·9 S	2·5 W	0·0	14·9 W	5·0 N	10·7 W	5·9 N	0·5 W	8·7 N	1·4 E	5·6 N	1·3 E
12	9·1 N	13·6 W	11·7 S	2·5 E	0·8 N	19·4 W	4·9 N	12·3 W	6·5 N	0·4 W	6·8 N	0·1 W	0·4 S	1·4 E
13	...	...	17·4 S	1·7 E	4·2 S	24·9 W	2·9 N	14·3 W	9·7 N	4·0 E	7·0 N	1·1 E	4·9 N	0·1 E
14	3·3 S	8·8 W	8·3 S	25·2 W	8·8 S	20·5 W	0·4 S	12·5 W	7·1 N	4·5 E	7·2 N	2·7 E	6·0 N	1·4 W
15	5·9 S	9·6 W	3·6 N	20·4 W	7·0 S	20·0 W	3·8 S	14·1 W	0·0	0·2 E	6·0 N	1·3 E	6·8 N	0·8 W
16	6·5 S	9·5 W	0·9 N	10·0 W	8·1 S	16·6 W	3·7 S	10·9 W	5·5 N	2·1 E	7·1 N	0·7 W	5·9 N	2·1 W
17	...	...	8·2 S	6·3 W	2·7 S	16·9 W	0·8 S	7·9 W	4·3 N	1·0 E	8·1 N	1·2 W	8·1 N	1·4 W
18	...	...	1·6 S	22·7 W	0·7 N	21·7 W	4·0 N	17·5 W	4·6 N	1·1 E	7·3 N	2·7 W	6·8 N	1·0 W
19	2·0 S	15·7 W	8·4 S	30·0 W	3·3 S	22·5 W	2·5 S	11·6 W	7·0 N	0·1 E	6·0 N	0·4 W	4·1 N	0·1 E
20	8·8 S	11·3 W	10·4 S	25·2 W	9·0 S	19·3 W	10·0 S	2·0 W	0·2 N	1·7 W	2·7 N	0·1 E	5·7 N	1·0 W
21	7·6 S	12·3 W	9·2 S	24·2 W	10·4 S	17·9 W	0·7 N	4·5 E	19·3 S	1·5 E	5·0 N	0·1 E	8·8 N	3·1 W
22	7·0 S	11·5 W	2·8 S	20·5 W	4·7 S	16·9 W	1·9 S	4·9 W	8·7 S	1·5 E	3·5 N	2·4 E	8·1 N	2·5 W
23	11·1 S	6·5 W	3·4 S	16·9 W	8·6 S	13·1 W	3·9 S	0·1 W	9·0 N	1·3 W	3·7 N	1·6 E	7·2 N	2·7 W
24	12·8 S	9·5 W	2·1 S	15·9 W	8·5 S	12·0 W	8·7 S	8·7 E	9·3 N	3·1 E	7·8 N	0·2 E	5·3 N	1·3 W
25	6·6 S	17·1 W	4·0 S	16·4 W	3·2 S	13·1 W	5·8 S	1·4 W	10·6 N	3·5 E	9·6 N	3·2 E	7·4 N	1·7 E
26	8·6 S	18·7 W	5·8 S	16·6 W	5·0 S	11·0 W	6·6 S	5·3 W	6·8 N	0·4 W	7·4 N	0·1 W	10·2 N	2·0 W
27	9·7 S	19·6 W	8·7 S	19·3 W	1·1 S	12·4 W	7·7 S	3·0 W	8·1 N	0·3 E	8·9 N	7·9 E		
28	9·5 S	22·0 W	14·1 S	18·4 W	3·6 S	11·3 W	2·2 S	5·5 W	7·8 N	4·4 W	8·5 N	9·5 E	8·8 N	1·8 W
29	4·4 S	21·1 W	13·9 S	19·2 W	4·0 S	9·2 W	1·1 N	5·8 W	5·3 N	1·8 W	15·5 N	6·5 E	7·4 N	1·7 W
30	3·9 S	15·6 W	9·3 S	19·4 W	3·0 S	8·8 W	1·2 S	5·1 W	4·8 N	2·3 W	1·9 N	7·2 E	7·1 N	1·3 W
31			5·6 S	21·3 W	6·1 S	8·1 W			5·6 N	1·5 E			9·6 N	2·4 W
Monthly Mean.	4·5 S	12·5 W	6·3 S	15·4 W	4·1 S	17·0 W	2·6 S	8·5 W	4·0 N	0·3 W	7·7 N	1·7 E	6·6 N	0·5 W

Diurnal Variation of the Velocity of the North and East Components of the Wind, 1867.

TABLE XXIII.—*Showing the Excess of the Means of the North or South and East or West Components of the Velocities of the Winds which blew at each Hour of the Day, above the respective Means for the whole Day, in the months June to December* 1867.

In miles per hour.

1867. Bombay Civil Time.	MONTH.													
	June.		July.		August.		September.		October.		November.		December.	
	N. or S.	E. or W.	N. or. S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
12 to 1 A.M.	1·5 S	0·5 W	1·4 S	0·6 E	2·2 S	0·1 W	0·6 S	0·5 E	1·2 S	1·5 E	1·6 S	2·3 E	0·7 S	2·1 E
1 „ 2 „	0·6 S	0·8 E	0·0	1·0 E	0·6 S	0·1 E	0·2 N	0·6 E	0·5 S	2·2 E	1·4 S	5·1 E	1·4 S	2·2 E
2 „ 3 „	0·4 S	0·3 E	0·1 N	1·2 E	0·8 S	0·1 W	0·1 S	0·5 E	1·8 S	3·2 E	1·2 S	5·3 E	2·2 S	3·3 E
3 „ 4 „	0·4 N	1·2 E	0·7 S	2·6 E	0·8 S	0·5 W	0·4 N	0·3 E	1·0 S	3·3 E	0·6 S	6·2 E	1·8 S	4·6 E
4 „ 5 „	0·3 S	1·1 E	0·5 N	1·1 E	0·3 S	0·9 E	0·4 S	0·6 E	0·8 S	3·6 E	0·1 S	7·1 E	1·3 S	4·6 E
5 „ 6 „	1·0 S	2·2 E	0·2 N	1·5 E	1·1 N	0·1 E	1·0 S	2·7 E	0·9 S	4·7 E	0·0	7·1 E	1·0 S	4·6 E
6 „ 7 „	1·5 S	4·7 E	0·0	3·2 E	0·9 N	1·5 E	0·2 S	3·3 E	0·6 S	4·8 E	0·6 S	7·4 E	1·6 S	5·1 E
7 „ 8 „	0·6 S	2·3 E	0·9 S	2·3 E	0·1 N	0·9 E	0·2 S	4·2 E	0·5 S	5·7 E	0·7 S	7·6 E	1·8 S	5·4 E
8 „ 9 „	0·7 N	2·6 E	0·4 N	2·5 E	0·5 S	0·4 E	0·6 S	4·5 E	1·9 S	6·1 E	0·5 S	6·8 E	1·5 S	7·2 E
9 „ 10 „	0·0	1·9 E	0·6 N	1·1 E	0·3 N	1·0 E	1·2 S	3·1 E	1·8 S	5·3 E	1·0 S	6·1 E	1·2 S	7·1 E
10 „ 11 „	0·0	0·9 E	1·2 S	0·2 E	0·3 N	1·1 E	0·7 S	0·2 E	3·1 S	4·1 E	2·7 S	3·9 E	1·6 S	5·1 E
11 „ 12 „	0·1 N	0·0	0·6 S	0·8 W	0·4 N	0·4 E	1·1 S	0·6 W	3·4 S	1·0 E	3·3 S	2·2 E	2·1 S	2·8 E
12 to 1 P.M.	0·6 S	0·6 W	1·6 N	2·7 W	1·1 N	1·9 W	0·8 S	2·1 W	0·6 S	3·4 W	2·3 S	0·7 W	1·3 S	1·8 W
1 „ 2 „	1·3 N	1·6 W	0·7 N	3·8 W	0·6 N	0·8 W	0·7 S	2·0 W	0·1 S	5·3 W	1·4 S	7·3 W	0·0	5·2 W
2 „ 3 „	2·0 N	2·9 W	0·6 N	2·9 W	0·6 S	1·6 W	0·7 N	2·8 W	1·5 N	7·5 W	0·2 N	9·0 W	0·7 N	7·6 W
3 „ 4 „	1·9 N	3·5 W	0·2 S	3·3 W	0·6 N	2·6 W	1·2 N	3·2 W	2·3 N	9·1 W	1·2 N	9·7 W	1·8 N	8·5 W
4 „ 5 „	1·4 N	2·8 W	0·4 N	1·5 W	1·2 N	0·5 W	1·4 N	3·5 W	3·3 N	8·8 W	2·1 N	9·7 W	2·1 N	8·5 W
5 „ 6 „	0·4 N	2·5 W	1·6 N	2·1 W	1·1 N	1·1 W	1·2 N	2·7 W	4·2 N	7·2 W	3·0 N	9·1 W	3·1 N	7·9 W
6 „ 7 „	0·8 N	2·2 W	1·1 N	1·5 W	0·8 N	0·8 W	1·1 N	1·1 W	3·8 N	4·9 W	4·1 N	7·4 W	3·8 N	6·8 W
7 „ 8 „	0·5 N	1·4 W	0·2 S	0·0	0·4 N	0·2 W	0·6 N	1·2 W	3·8 N	2·3 W	4·3 N	6·2 W	4·6 N	5·3 W
8 „ 9 „	0·3 S	0·1 W	0·2 S	0·0	0·3 S	0·9 E	0·6 N	0·4 W	1·8 N	0·3 W	3·0 N	4·7 W	2·9 N	3·4 W
9 „ 10 „	0·9 S	0·0	0·7 S	0·5 E	0·5 S	0·4 E	0·1 S	0·0	0·8 N	0·2 W	1·6 N	2·6 W	1·2 N	1·0 W
10 „ 11 „	0·4 S	0·3 W	1·5 S	0·4 W	0·7 S	0·0	0·4 S	0·9 W	0·7 S	1·8 E	0·6 S	1·0 W	0·3 N	0·5 E
11 „ 12 „	0·6 S	0·0	1·0 S	1·2 E	1·4 S	1·4 E	0·1 N	0·1 E	1·6 S	2·4 E	2·4 S	1·1 E	0·1 S	0·8 E

Velocity of Wind, 1867.

TABLE XXIV.—*Mean Velocity of the Wind, in miles per hour, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Monthly Mean Velocity and its Variation from the Mean of the Year.*

1867.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1	...	10·4	10·7	6·9	7·4	9·0	15·7	22·4	15·2	10·2	13·0	9·8
2	5·8	11·5	7·9	9·2	12·3	...	16·6	24·6	12·3	9·3	11·9	7·6
3	8·5	...	...	9·8	6·0	12·5	20·6	29·0	13·7	7·5	11·1	8·2
4	7·8	15·9	...	11·1	6·1	12·3	18·1	23·5	14·9	10·4	11·0	7·6
5	5·0	10·0	15·2	12·4	...	12·9	6·9	29·9	17·8	5·4	11·2	9·7
6	...	16·7	18·3	15·3	12·3	11·9	16·0	29·5	16·7	7·6	12·5	9·2
7	8·6	9·8	9·6	...	13·5	13·0	17·2	23·0	15·7	9·2	8·9	9·7
8	12·6	9·2	7·6	9·5	...	11·7	15·8	17·1	14·0	10·9	11·0	9·0
9	9·6	9·5	11·2	8·2	15·3	...	15·5	16·8	11·0	10·0	12·7	8·5
10	7·5	...	...	6·9	10·6	...	13·1	11·1	10·3	10·8	14·4	10·0
11	6·4	13·9	11·1	5·6	9·9	16·5	12·5	15·2	11·9	9·1	14·3	8·5
12	6·2	14·5	8·0	9·9	...	...	14·8	19·5	14·0	9·4	10·4	5·1
13	...	14·4	13·4	11·7	14·6	21·7	24·1	25·7	15·0	12·6	10·3	8·1
14	10·2	9·4	14·4	...	18·6	14·9	27·0	22·5	12·7	11·4	11·8	7·7
15	10·3	9·5	14·6	11·2	14·3	...	22·3	22·0	14·8	7·7	9·6	8·9
16	7·8	12·8	8·6	11·1	7·7	...	14·7	18·7	11·8	10·0	9·5	9·2
17	6·9	...	...	12·4	5·4	13·7	15·7	18·6	9·5	6·5	10·1	9·5
18	4·7	10·9	14·4	11·3	10·3	16·5	24·0	22·1	18·6	7·6	9·3	8·5
19	9·2	12·6	...	...	...	16·6	32·1	23·1	12·3	9·6	8·4	8·9
20	...	12·2	7·2	7·6	7·1	16·2	27·3	21·5	12·5	9·7	6·6	7·0
21	9·7	9·2	6·6	...	6·7	15·1	26·1	21·1	9·7	22·2	8·2	11·0
22	11·2	9·3	12·1	11·2	7·3	19·4	21·0	17·8	9·2	11·5	9·5	10·1
23	4·7	12·0	12·6	16·2	7·6	...	17·6	16·2	11·0	10·7	9·4	9·7
24	14·7	...	...	14·8	8·0	17·8	16·3	15·0	16·2	11·2	11·0	8·1
25	19·7	7·2	11·2	6·3	8·1	16·5	17·2	14·0	9·5	13·1	13·0	11·2
26	14·2	10·6	12·9	5·9	...	21·7	18·1	12·5	9·6	8·8	10·2	11·2
27	...	14·5	7·7	9·0	5·2	24·2	21·9	13·0	12·5	9·1	12·3	...
28	7·2	14·7	10·4	...	8·5	24·2	24·0	12·5	10·2	9·7	14·2	10·0
29	10·0		7·2	8·4	9·0	22·9	24·1	10·1	8·5	7·7	20·8	9·2
30	17·3		7·4	9·7	7·3	...	21·7	9·8	10·5	7·1	16·0	9·0
31	15·5		...		10·1		22·5	10·4		9·2		10·5
Monthly Mean.	9·7	11·7	10·8	10·0	9·6	16·4	19·4	18·3	12·7	9·8	11·4	9·0
Annual Variation.	− 2·7	− 0·7	− 1·6	− 2·4	− 2·8	+ 4·0	+ 7·0	+ 5·9	+ 0·2	− 2·6	− 1·0	− 3·4

	Miles.
The Mean Velocity for June to August	18·0
The Mean Velocity for September to May	10·5
The Mean Velocity for the Year	12·4
The greatest monthly mean (that of July)	19·4
The least monthly mean (that of December)	9·0
Difference............	10·4

Velocity of Wind, 1867.

Table XXV.—*The Mean Diurnal Variation of the Velocity of the Wind, in miles per hour, for each Month and for the whole Year; or the Excess of the Mean Hourly Velocity above the respective Monthly and Annual Means.*

1867. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
12 to 1 A.M.	− 6·1	− 2·8	− 3·0	− 3·2	− 2·9	− 1·2	− 1·3	+ 0·7	− 0·4	− 2·1	− 3·2	− 2·3	− 2·3
1 „ 2 „	− 5·3	− 3·1	− 1·8	− 3·9	− 1·1	− 0·8	− 1·5	− 0·2	+ 0·5	− 1·9	− 1·3	− 3·2	− 2·0
2 „ 3 „	− 4·4	− 3·4	− 2·5	− 4·1	− 2·9	− 3·3	− 1·6	+ 0·1	+ 0·5	− 2·3	− 0·8	− 3·3	− 2·3
3 „ 4 „	− 4·0	− 4·1	− 4·8	− 6·5	− 3·4	0·0	− 0·7	+ 0·2	+ 0·3	− 2·3	+ 0·2	− 2·0	− 2·3
4 „ 5 „	− 4·4	− 4·8	− 5·4	− 7·3	− 4·8	− 0·9	− 1·1	− 0·9	+ 0·1	− 2·3	+ 1·2	− 1·6	− 2·7
5 „ 6 „	− 4·4	− 4·4	− 7·2	− 6·8	− 5·3	− 1·1	− 0·4	− 0·4	+ 0·6	− 1·9	+ 1·1	− 1·1	− 2·6
6 „ 7 „	− 2·2	− 4·4	− 7·3	− 7·7	− 4·8	+ 1·9	− 1·3	− 1·6	− 0·9	− 2·0	+ 0·9	− 1·4	− 2·6
7 „ 8 „	− 3·3	− 5·0	− 7·0	− 7·0	− 3·7	− 0·7	− 1·0	− 0·8	− 1·2	− 1·2	+ 1·6	− 1·3	− 2·5
8 „ 9 „	− 2·3	− 5·0	− 4·4	− 5·2	− 2·6	− 2·8	+ 0·5	− 0·4	− 0·1	− 0·6	+ 1·1	+ 0·2	− 1·8
9 „ 10 „	− 1·7	− 3·2	− 3·3	− 3·5	− 0·6	− 1·1	+ 1·1	− 1·0	+ 0·5	− 1·1	+ 0·3	− 0·1	− 1·1
10 „ 11 „	− 2·4	− 2·1	− 2·3	− 0·2	+ 0·7	− 0·7	+ 0·1	− 1·1	+ 0·5	− 0·8	− 2·2	− 1·4	− 1·0
11 „ 12 „	− 2·0	+ 1·8	+ 2·4	+ 3·5	+ 2·3	+ 0·4	+ 0·2	− 0·4	+ 0·9	− 0·3	− 3·6	− 2·6	+ 0·2
12 „ 1 P.M.	+ 0·8	+ 4·3	+ 4·9	+ 5·3	+ 4·1	+ 1·8	+ 2·0	+ 1·4	+ 1·3	+ 1·5	− 1·8	− 1·3	+ 2·0
1 „ 2 „	+ 5·7	+ 5·4	+ 11·2	+ 7·9	+ 6·4	+ 1·6	+ 2·9	+ 1·2	+ 1·0	+ 2·6	− 0·7	+ 1·1	+ 3·9
2 „ 3 „	+ 6·0	+ 6·7	+ 11·1	+ 9·3	+ 7·5	+ 1·1	+ 1·9	+ 2·2	+ 1·1	+ 3·7	+ 1·7	+ 2·8	+ 4·6
3 „ 4 „	+ 7·3	+ 6·8	+ 10·5	+ 10·1	+ 8·0	+ 2·1	+ 2·3	+ 2·6	+ 1·0	+ 5·2	+ 3·3	+ 4·1	+ 5·3
4 „ 5 „	+ 8·0	+ 6·6	+ 10·2	+ 9·7	+ 6·7	+ 1·5	+ 0·2	+ 0·7	+ 0·6	+ 4·4	+ 3·1	+ 4·0	+ 4·6
5 „ 6 „	+ 8·4	+ 7·1	+ 7·2	+ 8·4	+ 5·4	+ 2·9	+ 0·4	+ 1·1	+ 0·1	+ 3·9	+ 3·1	+ 4·4	+ 4·4
6 „ 7 „	+ 7·1	+ 6·2	+ 5·4	+ 6·3	+ 3·1	+ 1·5	+ 0·1	+ 0·8	− 0·6	+ 2·7	+ 2·9	+ 4·1	+ 3·3
7 „ 8 „	+ 6·5	+ 5·1	+ 1·8	+ 3·0	+ 0·7	− 1·3	− 0·8	− 0·2	− 1·0	+ 2·3	+ 2·4	+ 3·9	+ 1·9
8 „ 9 „	+ 1·5	+ 1·4	− 0·6	+ 0·1	− 2·5	+ 1·0	− 0·6	− 1·2	− 1·6	+ 0·1	+ 0·2	+ 1·7	0·0
9 „ 10 „	− 1·2	− 2·1	− 4·4	− 1·5	− 2·9	− 0·7	− 0·8	− 0·7	− 1·1	− 2·2	− 1·6	− 0·5	− 1·6
10 „ 11 „	− 3·4	− 3·4	− 5·2	− 3·3	− 2·4	− 1·1	− 0·1	− 0·1	− 0·2	− 1·9	− 3·5	− 1·4	− 2·2
11 „ 12 „	− 4·7	− 4·0	− 4·5	− 3·2	− 4·0	+ 0·2	− 1·2	− 1·2	− 1·1	− 2·3	− 4·0	− 1·8	− 2·6

	Miles.
The Mean Velocity of the Wind for the hours from 9 P.M. to 9 A.M.	10·1
The Mean Velocity of the Wind for the hours from 9 A.M. to 9 P.M.	14·7
The Mean Velocity for 24 hours	12·4

In the Mean Diurnal Variation for the year a Maximum occurs between 3 and 4 P.M., and a Minimum about 5 A.M.

Aggregate and Mean Velocities and Relative Frequency of Different Winds, 1867.

TABLE XXVI.—*Showing for the year 1867 the sums of the Velocities and the Mean Velocities, in miles per hour, of the Winds which blew in each Month, from each of the Sixteen Principal Directions: also the Number of Observations which those sums comprise; the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.*

1867. Month.	N.					NNE.					NE.					ENE.				
	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.
			Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*		
	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.
January	1268·6	128·5	1480·0	149·9	9·9	198·4	30·5	231·5	35·6	6·5	567·2	99·0	661·7	115·5	5·7	194·6	29·5	227·0	34·4	6·6
February	1787·8	188·5	2085·8	219·9	9·5	193·7	24·5	226·0	28·6	7·9	473·3	66·0	552·2	77·0	7·2	65·3	8·0	76·2	9·3	8·2
March	331·2	57·0	386·4	66·5	5·8	45·8	10·5	53·4	12·2	4·4	177·3	39·0	206·8	45·5	4·5	14·1	5·0	16·4	5·8	2·8
April	211·4	31·0	246·6	36·2	6·8	35·6	4·0	41·5	4·7	8·9	54·6	12·0	63·7	14·0	4·5					
May	8·3	2·0	9·7	2·3	4·1															
June	5·4	1·0	6·3	1·2	5·4	17·6	2·0	20·5	2·3	8·8	31·7	6·0	37·0	7·0	5·3	4·3	1·0	5·0	1·2	4·3
July											6·0	1·0	6·0	1·0	6·0	35·0	3·0	35·0	3·0	11·7
August																				
September	39·0	7·0	39·0	7·0	5·6	7·0	1·0	7·0	1·0	7·0	70·0	10·0	70·0	10·0	7·0	60·0	5·0	60·0	5·0	12·0
October	416·0	63·0	416·0	63·0	6·6	440·0	65·0	440·0	65·0	6·8	1431·0	165·0	1431·0	165·0	8·7	368·0	50·0	368·0	50·0	7·4
November	607·0	76·0	607·0	76·0	8·0	422·0	53·0	422·0	53·0	8·0	2694·0	234·0	2694·0	234·0	11·5	692·0	62·0	692·0	62·0	11·2
December	826·0	108·0	826·0	108·0	7·6	587·0	99·0	587·0	99·0	5·9	1241·0	171·0	1241·0	171·0	7·3	244·0	35·0	244·0	35·0	7·0
Year			6102·8	730·0	8·4			2028·9	301·4	6·7			6963·4	840·0	8·3			1723·6	205·7	8·4

[*Continued.*

1867. Month.	E.					ESE.					SE.					SSE.				
	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities.	Number of Observations.	Mean Velocity.
			Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*		
	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.
January	351·8	65·5	410·4	76·4	5·4	70·0	7·0	81·7	8·2	10·0	8·9	2·0	10·4	2·3	4·4					
February	137·9	21·0	160·9	24·5	6·6	12·5	2·0	14·6	2·3	6·2										
March	31·1	11·0	36·3	12·8	2·8	9·0	2·0	10·5	2·3	4·5	90·7	9·0	105·8	10·5	10·1	8·2	1·0	9·6	1·2	8·2
April	47·3	10·0	55·2	11·7	4·7						7·2	2·0	8·4	2·3	3·6					
May											77·4	9·0	90·3	10·5	8·6					
June	23·5	5·0	27·4	5·8	4·7						1·9	1·0	2·2	1·2	1·9	51·0	3·0	59·5	3·5	17·0
July	20·0	3·0	20·0	3·0	6·7	108·0	8·0	108·0	8·0	13·5	632·0	28·0	632·0	28·0	22·6	290·0	19·0	290·0	19·0	15·3
August						15·0	2·0	15·0	2·0	7·5						14·0	2·0	14·0	2·0	7·0
September	97·0	9·0	97·0	9·0	10·8	293·0	27·0	293·0	27·0	10·9	327·0	24·0	327·0	24·0	13·6	303·0	21·0	303·0	21·0	14·4
October	106·0	19·0	106·0	19·0	5·6	98·0	11·0	98·0	11·0	8·9	118·0	12·0	118·0	12·0	9·8	545·0	34·0	545·0	34·0	16·0
November	286·0	31·0	286·0	31·0	9·2	223·0	13·0	223·0	13·0	17·2						24·0	3·0	24·0	3·0	8·0
December	258·0	42·0	258·0	42·0	6·1															
Year......			1457·2	235·2	6·2			843·8	73·8	11·4			1294·1	90·8	14·3			1245·1	83·7	14·9

[*Continued.*

1867. Month.	S.					SSW.					SW.					WSW.				
	Sums of Velocities.	Number of Obser-vations.	Sums of Velocities.	Number of Observa-tions.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Sums of Velocities.	Number of Obser-vations.	Mean Velo-city.	Sums of Velocities.	Number of Obser-vations.	Sums of Velocities.	Number of Observa-tions.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Sums of Velocities.	Number of Obser-vations.	Mean Velo-city.
			Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*					Increased by one-sixth from January to June.*		
	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.
January	45·4	5·0	53·0	5·8	9·1						62·0	5·0	72·3	5·8	12·4	33·1	3·0	38·6	3·5	11·0
February																				
March	6·0	2·0	7·0	2·3	3·0						112·9	12·0	131·7	14·0	9·4	7·6	1·0	8·9	1·2	7·6
April	32·7	7·0	38·1	8·2	4·7						43·4	7·0	50·6	8·2	6·2	42·9	4·5	50·0	5·2	9·5
May	672·7	46·0	784·8	53·7	14·6	518·5	52·0	604·9	60·7	10·0	880·9	98·0	1027·7	114·3	9·0	291·2	28·0	339·7	32·7	10·4
June	463·0	29·5	540·2	34·4	15·7	599·5	37·5	699·4	43·7	16·0	1886·0	115·0	2200·3	134·2	16·4	1120·0	50·0	1306·7	58·3	22·4
July	259·0	12·0	259·0	12·0	21·6	391·0	23·0	391·0	23·0	17·0	1151·0	59·0	1151·0	59·0	19·5	7714·0	365·0	7714·0	365·0	21·1
August	8·0	1·0	8·0	1·0	8·0	104·0	9·0	104·0	9·0	11·6	1117·0	74·0	1117·0	74·0	15·1	6472·0	339·0	6472·0	339·0	19·1
September	157·0	14·0	157·0	14·0	11·2	308·0	22·0	308·0	22·0	14·0	899·0	75·0	899·0	75·0	12·0	2190·0	171·0	2190·0	171·0	12·8
October	254·0	14·0	254·0	14·0	18·1	201·0	9·0	201·0	9·0	22·3	54·0	7·0	54·0	7·0	7·7	222·0	21·0	222·0	21·0	10·6
November																21·0	4·0	21·0	4·0	5·2
December																44·0	9·0	44·0	9·0	4·9
Year......			2101·1	145·4	14·5			2308·3	167·4	13·8			6703·6	491·5	13·6			18406·9	1009·9	18·2

[*Continued.*

1867.	W.					WNW.					NW.					NNW.				
Month.	Sums of Velocities.	Number of Observations.	Sums of Velocities. Increased by one-sixth from January to June.*	Number of Observations. Increased by one-sixth from January to June.*	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities. Increased by one-sixth from January to June.*	Number of Observations. Increased by one-sixth from January to June.*	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities. Increased by one-sixth from January to June.*	Number of Observations. Increased by one-sixth from January to June.*	Mean Velocity.	Sums of Velocities.	Number of Observations.	Sums of Velocities. Increased by one-sixth from January to June.*	Number of Observations. Increased by one-sixth from January to June.*	Mean Velocity.
	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.	Miles.		Miles.		Miles.
January	553·7	43·0	646·0	50·2	12·9	92·2	10·0	107·6	11·7	9·2	2297·4	150·5	2680·3	175·6	15·3	186·7	14·5	217·8	16·9	12·9
February						17·6	2·0	20·5	2·3	8·8	3235·8	199·0	3775·1	232·2	16·3	493·6	33·0	575·9	38·5	15·0
March	339·8	38·0	396·4	44·3	8·9	1264·4	70·5	1475·1	82·2	17·9	3143·2	215·5	3667·1	251·4	14·6	623·3	62·5	727·2	72·9	10·0
April	149·4	15·5	174·3	18·1	9·6	850·8	60·0	992·6	70·0	14·2	3225·1	277·0	3762·6	323·2	11·6	1293·5	104·0	1509·1	121·3	12·4
May	217·1	41·0	253·3	47·8	5·3	691·1	63·0	806·3	73·5	11·0	1608·5	157·0	1876·6	183·2	10·2	617·5	48·0	720·4	56·0	12·9
June	2022·7	117·0	2359·8	136·5	17·3	1725·9	104·0	2013·5	121·3	16·6	895·6	58·0	1044·9	67·7	15·4	150·9	7·0	176·0	8·2	21·6
July	2921·0	149·0	2921·0	149·0	19·6	702·0	38·0	702·0	38·0	18·5	195·0	13·0	195·0	13·0	15·0	40·0	3·0	40·0	3·0	13·3
August	4805·0	240·0	4805·0	240·0	20·0	691·0	40·0	691·0	40·0	17·3	15·0	1·0	15·0	1·0	15·0	9·0	3·0	9·0	3·0	3·0
September	2653·0	210·0	2653·0	210·0	12·6	1367·0	110·0	1367·0	110·0	12·4	181·0	19·0	181·0	19·0	9·5	12·0	1·0	12·0	1·0	12·0
October	218·0	24·0	218·0	24·0	9·1	422·0	46·0	422·0	46·0	9·2	1243·0	100·0	1243·0	100·0	12·4	1124·0	86·0	1124·0	86·0	13·1
November	116·0	14·0	116·0	14·0	8·3	222·0	19·0	222·0	19·0	11·7	1509·0	108·0	1509·0	108·0	14·0	1327·0	99·0	1327·0	99·0	13·4
December	18·0	2·0	18·0	2·0	9·0	285·0	27·0	285·0	27·0	10·6	1670·0	137·0	1670·0	137·0	12·2	1189·0	99·0	1189·0	99·0	12·0
Year			14560·8	935·9	15·6			9104·6	641·0	14·2			21619·6	1611·3	13·4			7627·4	604·8	12·6

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* The numbers in columns 1 and 2 for each direction are derived for January to June from Observations made on *week-days only*, whilst those for July to December are derived from the registrations of an automatic instrument which was kept in action on Sundays as well as week-days: therefore, to render the whole year comparable, in columns 3 and 4 the numbers for January to June are increased by one-sixth.

Aggregate Velocities of Different Winds, 1867.

TABLE XXVII.—*Showing, for the year* 1867, *the Sums of the Velocities, per hour, of the Winds which blew at each Hour of the Day from each of the Sixteen Principal Directions.*

Bombay Civil Time.	N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.	WNW.	NW.	NNW.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
Midnight.	399·51	196·72	571·46	57·55	28·69		77·20	41·00	34·51	89·84	438·03	901·00	297·66	201·43	488·93	124·50
1 A.M.	342·45	194·26	340·84	53·39	84·14	48·00	30·00	33·00	42·71	82·13	362·79	774·70	494·06	203·98	477·91	146·16
2 "	346·18	149·22	373·52	81·40	78·43	102·64	35·00	40·00	9·45	110·35	396·02	755·90	468·68	150·49	393·96	205·47
3 "	298·14	163·41	433·88	128·85	74·79	108·24	34·83	61·00	6·24	125·66	377·90	750·41	496·58	125·15	283·76	146·13
4 "	253·15	256·23	524·86	113·86	33·87	130·86	38·67	52·73	14·93	108·47	214·68	813·14	575·20	109·44	177·87	80·62
5 "	248·54	233·55	628·35	70·57	103·32	57·00	131·70	48·95	69·15	60·46	185·84	779·90	513·20	115·95	161·52	86·71
6 "	192·24	204·23	663·31	129·38	112·75	57·00	112·01	66·23	119·86	70·75	198·86	634·12	584·99	112·09	146·58	20·31
7 "	162·41	193·63	667·03	199·76	142·93	70·78	130·55	52·53	158·56	163·54	189·04	677·37	483·79	94·75	158·66	47·37
8 "	189·61	176·73	699·70	193·86	172·85	93·82	146·13	84·02	98·12	87·58	202·94	674·51	488·36	144·73	127·42	93·11
9 "	115·20	141·00	677·26	240·22	264·67	50·78	125·06	86·00	113·40	55·19	225·59	770·42	491·56	187·35	186·02	119·51
10 "	120·70	72·64	646·37	177·13	148·05	32·00	22·69	148·33	164·98	80·69	263·91	744·99	510·38	152·65	450·79	200·99
11 "	239·03	25·06	405·22	124·72	156·02	22·64	4·30	122·00	116·11	98·33	323·44	733·82	663·69	290·37	721·60	228·60
Noon.	33·46	14·26	234·28	41·93	47·01	9·00		69·00	119·08	101·66	287·84	861·90	688·43	658·15	1416·70	244·41
1 P.M.	42·46	7·49	94·46	15·00	32·18	16·00		72·00	101·72	131·33	402·17	907·66	802·22	849·39	1880·12	239·23
2 "	19·68		58·00		22·00	11·00			132·39	96·14	378·27	874·13	844·72	912·96	2311·14	257·59
3 "	32·72		70·00	7·00			5·00	14·00	105·63	96·60	289·35	811·64	1017·10	889·77	2571·67	220·68
4 "		20·00	25·00	5·00				17·00	95·25	125·83	271·95	719·05	1009·98	850·36	2518·53	369·09
5 "	77·99	10·00	26·00					9·00	50·32	119·62	251·52	465·37	931·79	653·49	2362·77	778·87
6 "	154·45	31·00	39·00					19·00	62·16	64·41	321·19	698·03	799·68	536·85	1798·02	1110·84
7 "	394·01	21·00	65·00	42·00			18·00	29·00	39·69	53·36	222·87	829·97	711·15	612·63	1299·86	1151·65
8 "	630·04	11·00	44·00	5·00	30·00	8·00	15·00	47·00	47·00	103·30	207·36	724·84	626·63	321·15	814·88	964·46
9 "	796·10	37·00	54·13	9·00		7·00	9·00	70·00	48·66	78·30	244·54	794·44	625·85	234·38	380·57	562·70
10 "	744·77	69·23	88·12	46·00	4·00	12·00	37·00	53·40	104·94	74·50	271·35	704·59	582·02	212·88	225·63	347·74
11 "	536·45	152·24	183·80	19·41	10·84	21·00	67·00	30·50	94·97	83·93	346·64	860·85	410·26	215·10	253·61	208·59

For the hours and directions which have no entries 0·0 is to be understood.

Relative Frequency of Different Winds, 1867.

TABLE XXVIII.—*Showing, for the year* 1867, *the number of times on which the Wind was observed to blow at each Hour of the Day from each of the Sixteen Principal Directions.*

Bombay Civil Time.	N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.	WNW.	NW.	NNW.
Midnight.	57·0	29·4	27·6	7·3	6·7		7·2	4·0	3·3	9·0	32·8	46·0	28·7	18·7	50·7	16·7
1 A.M.	49·0	33·2	37·7	7·3	12·0	5·0	3·0	3·0	4·9	6·4	28·3	44·4	35·2	18·5	49·4	15·8
2 "	42·4	28·0	48·4	9·3	14·0	7·2	3·0	4·0	1·2	8·2	31·7	48·2	30·2	14·6	44·3	12·7
3 "	39·8	24·4	57·4	15·7	12·8	7·3	3·2	4·0	1·2	11·3	32·0	43·4	34·6	9·5	36·2	12·7
4 "	39·6	33·9	64·9	13·5	7·3	8·2	3·3	4·6	1·7	10·0	17·9	45·8	35·7	11·8	30·3	11·1
5 "	35·6	33·2	75·9	8·7	14·2	4·0	9·2	4·6	7·4	9·0	14·0	39·8	36·2	9·7	23·0	12·8
6 "	33·8	33·7	80·8	13·1	13·1	5·0	10·5	4·2	9·2	9·0	11·9	35·5	38·7	8·6	20·7	7·0
7 "	29·5	24·7	81·9	15·9	18·7	7·6	10·5	4·6	12·5	8·2	14·0	34·5	29·2	8·1	23·7	9·0
8 "	24·7	20·7	81·7	19·7	23·0	9·7	11·7	6·6	9·3	6·1	15·0	35·5	32·6	12·0	13·9	13·2
9 "	18·2	12·7	80·5	25·4	32·3	4·6	8·5	6·0	10·9	3·7	20·2	40·8	34·1	11·2	19·9	11·9
10 "	13·2	9·0	79·8	25·0	28·0	3·0	5·7	7·7	11·7	7·5	20·9	39·4	30·7	12·2	42·8	15·1
11 "	20·1	3·9	56·9	18·4	23·7	3·3	1·2	7·0	8·2	7·9	26·0	39·8	40·3	24·8	61·8	17·1
NOON.	4·5	2·9	31·9	8·2	10·8	2·0		4·0	9·6	7·7	19·2	47·2	40·1	45·7	104·5	14·0
1 P.M.	3·3	2·2	12·5	3·0	6·2	2·0		2·0	7·2	2·6	24·4	47·6	46·5	55·3	124·2	10·0
2 "	1·2		6·0		3·0	2·0			6·5	5·3	25·7	47·0	50·4	56·7	136·4	13·2
3 "	2·2		6·0	1·0			1·0	2·0	4·9	5·6	19·8	45·3	57·7	51·7	144·2	13·0
4 "		2·0	1·0	1·0				2·0	4·3	6·3	19·8	42·1	61·6	52·9	141·2	20·0
5 "	3·3	1·0	2·0					1·0	3·2	6·3	15·9	38·5	57·2	45·2	137·2	43·6
6 "	7·0	3·0	2·0					2·0	3·2	4·3	21·6	41·7	48·4	38·2	115·5	67·7
7 "	20·1	2·0	5·0	3·0			1·0	2·0	2·2	4·3	17·2	48·6	47·6	30·7	94·2	78·4
8 "	49·2	1·0	5·0	1·0	1·0	1·0	1·0	3·0	2·0	6·8	14·6	44·6	42·4	24·9	78·0	75·8
9 "	73·3	5·0	8·3	2·0		1·0	1·0	4·0	3·3	7·7	14·6	47·9	43·3	23·3	47·5	54·5
10 "	89·5	11·7	15·7	4·0	1·0	1·0	3·0	4·2	6·7	6·7	18·4	43·9	42·3	19·2	38·9	38·2
11 "	75·8	20·9	23·1	4·2	3·2	1·0	5·0	3·2	5·9	8·4	21·0	48·3	32·1	21·2	34·2	21·8

For the hours and directions which have no entries 0·0 is to be understood.

Barometric Pressure, 1868.

Table I.—*Mean Height of Standard Barometer (No. 58), Corrected for Temperature, for each Day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1868.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·903	...	29·963	29·865	29·650	29·752	29·743	29·799	29·841	...	29·932
2	29·992	...	29·893	·964	·828	·624	·772	...	·881	·841	29·865	·960
3	·989	·953	·885	·905	...	·587	·818	...	·870	·841	·894	30·001
4	·966	·959	·883	·881	·828	·589	·786	·761	·846	...	·925	·006
5	...	·924	·845	...	·831	·522	...	·741	·831	·880	·876	29·996
6	·933	·923	·879	·834	·803	·430	·762	·627	...	·836	·807	...
7	·915	·941	...	·819	·799	...	·757	·589	·838	·808	·804	·969
8	·924	·973	...	·812	·857	·413	·736	·594	·849	·812	...	·940
9	·916	...	·867	·806	·881	·515	·722	...	·856	·815	·813	·935
10	·926	·980	·912	...	...	·604	·686	·599	·826	·839	·796	·943
11	·946	·987	·900	·815	·801	·651	·663	·647	·795	...	·818	·922
12	...	·962	·927	...	·779	·657	...	·675	·782	·858	·886	·894
13	·985	·953	·917	·780	·815	·698	·697	·711	...	·857	·909	...
14	·967	·990	·937	·799	·830	...	·646	·732	·785	·850	·924	·961
15	·984	·989	...	·795	·806	·704	·657	·766	·770	·859	...	·967
16	·975	...	·877	·792	·836	·687	·710	...	·760	·873	·991	30·008
17	·957	·940	·887	·810	...	·738	·734	·739	·759	...	30·024	·053
18	·950	·931	·881	·821	·869	·768	·699	·751	·754	...	·002	·050
19	...	·904	·859	...	·800	·777	...	·805	·767	·904	29·988	29·994
20	·939	·900	·866	·815	·765	·793	·647	·800	...	·900	·960	...
21	·969	...	·892	·835	·783	...	·629	·794	·775	·879	·952	·943
22	·934	·876	...	·851	·803	·776	·624	·807	·826	·856	...	·925
23	·880	...	·850	·824	...	·762	·661	...	·868	·849	·960	·919
24	·842	·865	·842	·836	...	·788	·701	·855	·849	·887	·965	·918
25	·864	·828	·841	·789	·754	·793	·721	·855	·831	...	·971	...
26	...	·797	·827	...	·763	·762	...	·844	·847	·835	·975	·936
27	·899	·836	·871	·775	·750	·709	·715	·819	...	·861	·961	...
28	·878	·908	·902	·776	·736	...	·654	·808	·839	·895	·972	·973
29	·906	·888	...	·805	·679	·744	·623	·773	·828	·896	...	·980
30	·954		·889	·861	·649	·762	·615	...	·820	·866	·962	·956
31	·961		·899		...		·687	·707		·846		·952
Monthly Mean.	29·937	29·921	29·881	29·831	29·796	29·673	29·699	29·742	29·817	29·857	29·920	29·963
Annual Variation.	+0·101	+0·085	+0·045	−0·005	−0·040	−0·163	−0·137	−0·094	−0·019	+0·021	+0·084	+0·127

	in.
Mean of months from January to March and October to December	29·913
Mean of months from April to September	29·760
Mean for the Year	29·836
The greatest monthly mean (that of December)	29·963
The least monthly mean (that of June)	29·673
Difference...........	0·290

Barometric Pressure, 1868.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year; or the Excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·002	+0·014	+0·002	+0·004	+0·003	+0·003	+0·010	0·000	+0·005	−0·010	−0·001	+0·004	+0·003
1 A.M.	− ·011	− ·001	− ·012	− ·007	− ·011	− ·014	− ·008	− ·014	− ·008	− ·024	− ·013	− ·006	− ·011
2 „	− ·024	− ·016	− ·026	− ·017	− ·022	− ·026	− ·022	− ·030	− ·023	− ·032	− ·025	− ·019	− ·023
3 „	− ·035	− ·025	− ·031	− ·027	− ·027	− ·032	− ·029	− ·036	− ·031	− ·034	− ·030	− ·026	− ·030
4 „	− ·033	− ·030	− ·029	− ·020	− ·020	− ·025	− ·033	− ·035	− ·030	− ·029	− ·028	− ·026	− ·028
5 „	− ·022	− ·020	− ·017	− ·005	− ·009	− ·014	− ·025	− ·027	− ·019	− ·013	− ·017	− ·015	− ·017
6 „	− ·006	·000	+ ·004	+ ·015	+ ·010	+ ·001	− ·008	− ·012	− ·003	+ ·011	+ ·005	+ ·004	+ ·002
7 „	+ ·018	+ ·025	+ ·026	+ ·034	+ ·032	+ ·017	+ ·007	+ ·008	+ ·018	+ ·034	+ ·027	+ ·029	+ ·023
8 „	+ ·046	+ ·048	+ ·049	+ ·056	+ ·048	+ ·029	+ ·024	+ ·025	+ ·040	+ ·056	+ ·051	+ ·053	+ ·044
9 „	+ ·070	+ ·068	+ ·064	+ ·066	+ ·057	+ ·037	+ ·032	+ ·036	+ ·050	+ ·068	+ ·067	+ ·069	+ ·057
10 „	+ ·069	+ ·070	+ ·062	+ ·057	+ ·055	+ ·037	+ ·036	+ ·037	+ ·050	+ ·068	+ ·061	+ ·065	+ ·056
11 „	+ ·052	+ ·052	+ ·048	+ ·045	+ ·046	+ ·029	+ ·031	+ ·032	+ ·041	+ ·046	+ ·040	+ ·044	+ ·042
Noon.	+ ·020	+ ·019	+ ·022	+ ·023	+ ·030	+ ·019	+ ·020	+ ·020	+ ·019	+ ·019	+ ·010	+ ·010	+ ·019
1 P.M.	− ·011	− ·012	− ·005	− ·006	+ ·005	+ ·006	+ ·009	+ ·004	− ·003	− ·011	− ·020	− ·022	− ·005
2 „	− ·036	− ·040	− ·030	− ·031	− ·018	− ·013	− ·005	− ·010	− ·024	− ·035	− ·041	− ·045	− ·027
3 „	− ·049	− ·056	− ·050	− ·048	− ·037	− ·030	− ·020	− ·023	− ·037	− ·046	− ·050	− ·056	− ·042
4 „	− ·052	− ·057	− ·053	− ·058	− ·050	− ·038	− ·030	− ·031	− ·041	− ·044	− ·050	− ·055	− ·047
5 „	− ·046	− ·049	− ·047	− ·057	− ·049	− ·037	− ·032	− ·025	− ·038	− ·040	− ·038	− ·045	− ·042
6 „	− ·029	− ·035	− ·033	− ·044	− ·037	− ·022	− ·020	− ·013	− ·025	− ·029	− ·023	− ·030	− ·028
7 „	− ·009	− ·015	− ·016	− ·027	− ·022	− ·006	− ·006	·000	− ·009	− ·007	− ·002	− ·007	− ·010
8 „	+ ·012	+ ·007	+ ·005	− ·009	− ·006	+ ·010	+ ·007	+ ·014	+ ·009	+ ·012	+ ·015	+ ·009	+ ·007
9 „	+ ·026	+ ·021	+ ·023	+ ·010	+ ·007	+ ·021	+ ·019	+ ·025	+ ·023	+ ·018	+ ·026	+ ·022	+ ·020
10 „	+ ·026	+ ·023	+ ·028	+ ·018	+ ·016	+ ·029	+ ·025	+ ·028	+ ·024	+ ·017	+ ·025	+ ·023	+ ·023
11 „	+ ·018	+ ·019	+ ·020	+ ·014	+ ·009	+ ·021	+ ·020	+ ·019	+ ·019	+ ·007	+ ·015	+ ·014	+ ·016

In the Mean Diurnal Variation for the year—

A Minimum occurs..................at 3 A.M.
A Maximum ....at 9 A.M.
A Minimum ....at 4 P.M.
And a Maximum ....at 10 P.M.

Temperature of the Air, 1868.

TABLE III.—*Mean Temperature of the Air for each Day of Bombay Civil Time: also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1868. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	70·9	...	77·9	81·6	85·8	81·3	80·5	78·7	81·3	...	76·4
2	75·9	...	75·0	78·3	81·7	85·9	81·9	...	80·5	80·3	83·3	78·0
3	75·3	70·6	74·4	80·5	...	85·9	78·5	...	80·1	81·4	83·2	78·9
4	74·4	71·1	74·0	81·7	84·5	83·6	81·3	80·4	80·6	...	81·7	78·9
5	...	71·3	73·7	...	84·6	83·7	...	79·4	80·4	80·7	80·7	78·3
6	70·1	72·5	72·1	83·2	84·2	85·7	83·2	79·7	...	81·0	80·0	...
7	69·4	72·0	...	81·9	83·7	...	82·9	80·6	79·4	80·4	79·7	76·9
8	71·3	72·3	...	81·5	83·7	81·2	82·9	78·9	78·7	80·0	...	76·1
9	73·6	...	73·7	81·7	83·6	82·2	82·8	...	79·2	79·7	78·1	75·7
10	72·8	74·1	74·5	...	...	83·1	83·6	77·9	79·6	80·4	77·8	75·5
11	72·6	73·9	74·7	81·2	84·5	80·6	82·3	79·2	79·9	...	77·6	75·5
12	...	73·4	76·2	...	84·4	82·6	...	79·0	80·2	83·4	78·3	75·1
13	73·1	73·5	76·5	81·0	83·8	84·6	78·1	78·5	...	82·0	77·9	...
14	76·3	73·5	75·3	81·7	84·2	...	76·8	78·9	80·9	81·7	78·2	73·7
15	75·8	74·6	...	81·0	84·3	80·9	77·2	79·9	80·8	81·7	...	74·0
16	74·5	...	74·6	83·0	84·9	80·9	76·7	...	80·1	80·7	79·2	76·4
17	73·5	77·5	76·6	83·3	...	83·5	79·9	79·7	80·7	...	79·6	76·8
18	71·3	76·7	77·2	82·8	85·8	83·9	80·3	78·8	81·0	...	78·1	76·3
19	...	76·8	77·3	...	85·0	83·8	...	80·6	80·4	80·9	77·2	75·4
20	73·6	75·6	76·7	81·5	84·9	83·2	80·3	80·7	...	82·0	76·9	...
21	72·6	...	77·4	81·8	85·2	...	79·5	80·4	80·5	82·2	77·6	75·6
22	72·1	76·5	...	82·1	84·4	83·3	79·8	81·2	80·1	82·5	...	75·4
23	70·0	...	79·8	80·6	...	83·5	77·8	...	80·3	82·1	77·6	74·1
24	69·8	74·2	79·9	81·7	...	82·2	80·3	80·6	79·8	80·7	77·9	74·1
25	73·7	74·9	78·8	83·5	84·9	83·2	81·6	80·6	78·5	...	77·1	...
26	...	78·1	79·8	...	85·2	82·5	...	79·2	80·2	80·0	77·6	75·8
27	74·6	79·6	80·3	83·3	85·5	82·5	81·2	79·9	...	82·1	78·6	...
28	71·8	80·2	80·2	82·0	85·7	...	79·4	79·1	81·1	82·2	78·9	74·7
29	72·7	80·7	...	81·9	85·7	82·1	78·4	79·8	80·1	83·1	...	75·0
30	72·5		78·8	82·1	85·9	81·9	78·4	...	79·0	81·0	77·2	73·6
31	71·1		77·8		...		79·5	76·3		81·2		72·9
Monthly Mean.	72·9	74·8	76·6	81·6	84·5	83·2	80·2	79·6	80·0	81·3	78·8	75·7
Annual Variation.	− 6·2	− 4·3	− 2·5	+ 2·5	+ 5·4	+ 4·1	+ 1·1	+ 0·5	+ 0·9	+ 2·2	− 0·3	− 3·4

	°
Mean of months from January to March, and October to December............	76·7
Mean of months from April to September	81·5
Mean for the Year..	79·1
The greatest monthly mean (that of May)..................	84·5
The least monthly mean (that of January)	72·9
Difference..........	11·6

Temperature of the Air, 1868.

Table IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month and for the whole Year; or the Excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 2·9	− 2·9	− 2·4	− 2·5	− 2·6	− 1·6	− 1·1	− 1·0	− 1·5	− 2·6	− 2·8	− 2·7	− 2·2
1 A.M.	− 3·3	− 3·3	− 2·8	− 2·8	− 2·9	− 1·5	− 1·4	− 1·3	− 1·9	− 2·9	− 3·5	− 3·2	− 2·6
2 „	− 3·8	− 3·9	− 3·1	− 3·0	− 3·2	− 1·8	− 1·5	− 1·2	− 2·1	− 3·1	− 3·8	− 3·6	− 2·8
3 „	− 4·1	− 4·4	− 3·7	− 3·6	− 3·5	− 1·9	− 1·4	− 1·5	− 2·2	− 3·6	− 4·2	− 4·0	− 3·2
4 „	− 4·5	− 4·7	− 4·1	− 4·0	− 3·7	− 2·0	− 1·6	− 1·7	− 2·5	− 3·8	− 4·5	− 4·3	− 3·4
5 „	− 4·9	− 5·0	− 4·5	− 4·3	− 4·0	− 2·1	− 1·9	− 1·7	− 2·7	− 4·3	− 5·0	− 4·8	− 3·8
6 „	− 5·3	− 5·4	− 4·9	− 4·5	− 3·8	− 2·3	− 1·7	− 1·6	− 2·8	− 4·4	− 5·5	− 5·2	− 3·9
7 „	− 5·3	− 5·0	− 4·3	− 2·6	− 2·0	− 1·7	− 1·2	− 1·4	− 2·2	− 3·3	− 4·8	− 5·1	− 3·2
8 „	− 3·3	− 2·7	− 1·8	− 0·4	− 0·2	− 0·8	− 0·5	− 0·8	− 1·0	− 1·4	− 2·8	− 3·3	− 1·6
9 „	− 0·7	− 0·7	+ 0·4	+ 1·4	+ 0·9	+ 0·3	+ 0·1	+ 0·3	− 0·1	− 0·1	− 1·1	− 1·5	− 0·1
10 „	+ 1·4	+ 1·5	+ 2·1	+ 2·3	+ 2·0	+ 1·3	+ 0·8	+ 0·8	+ 1·0	+ 1·4	+ 0·6	+ 0·2	+ 1·3
11 „	+ 3·2	+ 3·7	+ 3·3	+ 3·3	+ 3·0	+ 1·9	+ 1·8	+ 1·6	+ 2·0	+ 2·8	+ 2·8	+ 2·2	+ 2·6
Noon.	+ 5·1	+ 5·3	+ 4·4	+ 4·2	+ 3·9	+ 2·7	+ 2·1	+ 2·3	+ 2·8	+ 4·5	+ 5·0	+ 4·7	+ 3·9
1 P.M.	+ 6·4	+ 5·9	+ 5·1	+ 4·9	+ 4·7	+ 3·0	+ 2·8	+ 2·7	+ 3·4	+ 5·5	+ 6·8	+ 6·7	+ 4·8
2 „	+ 6·9	+ 6·4	+ 5·5	+ 4·9	+ 4·9	+ 2·7	+ 2·7	+ 2·6	+ 3·8	+ 6·0	+ 7·5	+ 7·5	+ 5·1
3 „	+ 6·9	+ 6·3	+ 5·4	+ 5·0	+ 4·8	+ 2·7	+ 2·5	+ 2·4	+ 3·9	+ 5·9	+ 7·5	+ 7·8	+ 5·1
4 „	+ 6·2	+ 5·8	+ 4·9	+ 4·4	+ 4·1	+ 2·2	+ 2·2	+ 2·0	+ 3·5	+ 5·2	+ 6·5	+ 6·6	+ 4·5
5 „	+ 3·6	+ 4·1	+ 3·9	+ 3·1	+ 3·1	+ 1·4	+ 1·2	+ 0·9	+ 2·4	+ 3·4	+ 3·7	+ 3·9	+ 2·9
6 „	+ 1·6	+ 1·6	+ 1·4	+ 0·9	+ 1·2	+ 0·4	+ 0·2	0·0	+ 0·9	+ 1·4	+ 1·9	+ 2·1	+ 1·1
7 „	+ 0·8	+ 0·5	+ 0·2	− 0·2	− 0·4	− 0·3	− 0·2	− 0·5	0·0	+ 0·4	+ 1·0	+ 1·2	+ 0·2
8 „	+ 0·1	0·0	− 0·3	− 0·8	− 1·1	− 0·4	− 0·3	− 0·7	− 0·5	− 0·3	+ 0·2	+ 0·4	− 0·3
9 „	− 0·8	− 0·6	− 0·9	− 1·3	− 1·6	− 0·8	− 0·8	− 0·7	− 0·8	− 1·2	− 0·9	− 0·5	− 0·9
10 „	− 1·7	− 1·4	− 1·6	− 1·6	− 1·9	− 1·0	− 1·0	− 0·9	− 1·0	− 1·9	− 2·1	− 1·8	− 1·5
11 „	− 2·6	− 2·1	− 2·2	− 1·9	− 2·2	− 1·3	− 1·0	− 0·9	− 1·2	− 2·5	− 2·7	− 2·5	− 1·9

	°		°
Mean of the hours from 9 P.M. to 8 A.M.	76·5	Difference =	5·2
Mean of the hours from 9 A.M. to 8 P.M.	81·7		
Mean of 24 hours	79·1		

In the Mean Diurnal Variation for the year a Maximum occurs between 2 and 3 P.M., and a Minimum at 6 A.M.

Temperature of the Ground, 1868.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1868. MONTH.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.
	°	°	°	°	°	°	°	°
January	74·0	− 6·1	75·1	− 5·3	78·2	− 4·0	81·7	− 1·7
February	75·7	− 4·4	75·9	− 4·5	77·8	− 4·4	81·2	− 2·2
March	77·5	− 2·6	77·7	− 2·7	79·3	− 2·9	81·1	− 2·3
April	82·4	+ 2·3	81·7	+ 1·3	82·1	− 0·1	82·2	− 1·2
May	85·4	+ 5·3	84·4	+ 4·0	84·7	+ 2·5	83·8	+ 0·4
June	84·3	+ 4·2	84·5	+ 4·1	86·0	+ 3·8	85·7	+ 2·3
July	81·6	+ 1·5	82·5	+ 2·1	84·5	+ 2·3	85·2	+ 1·8
August	80·9	+ 0·8	81·6	+ 1·2	83·7	+ 1·5	84·6	+ 1·2
September	81·2	+ 1·1	81·5	+ 1·1	83·2	+ 1·0	84·1	+ 0·7
October	81·9	+ 1·8	82·1	+ 1·7	83·4	+ 1·2	83·9	+ 0·5
November	79·5	− 0·6	80·2	− 0·2	82·6	+ 0·4	83·9	+ 0·5
December	76·6	− 3·5	77·8	− 2·6	80·7	− 1·5	83·4	0·0

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to April, November and December	77·6	78·1	80·1	82·2
Do. of May to October	82·5	82·8	84·2	84·5
Do. for the Year	80·1	80·4	82·2	83·4
Greatest monthly mean (that of May)	85·4	......	......	......
Do. do. (that of June)	......	84·5	86·0	85·7
Least monthly mean (that of January)	74·0	75·1	......	......
Do. do. (that of February)	......	......	77·8	......
Do. do. (that of March)	......	......	......	81·1
Difference	11·4	9·4	8·2	4·6

Temperature of the Ground, 1868.

TABLE VI.—*Showing, for each Hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine inches respectively below the surface, and its Mean Diurnal Variation for the Year.*

1868. Bombay Civil Time.	DEPTH. 1 Inch. Mean Temperature.		DEPTH. 9 Inches. Mean Temperature.	
	Mean Temperature.	Excess over the mean of 24 hours.	Mean Temperature.	Excess over the mean of 24 hours.
	°	°	°	°
Midnight.	78·7	+ 1·4	80·5	+ 0·1
1 A.M.	78·4	− 1·7	80·4	0·0
2 "	78·2	− 1·9	80·3	− 0·1
3 "	77·9	− 2·2	80·3	− 0·1
4 "	77·6	− 2·5	80·2	− 0·2
5 "	77·4	− 2·7	80·1	− 0·3
6 "	77·2	− 2·9	80·1	− 0·3
7 "	77·6	− 2·5	80·0	− 0·4
8 "	78·7	− 1·4	80·0	− 0·4
9 "	79·7	− 0·4	80·1	− 0·3
10 "	80·5	+ 0·4	80·1	− 0·3
11 "	81·5	+ 1·4	80·3	− 0·1
Noon.	82·4	+ 2·3	80·4	0·0
1 P.M.	83·1	+ 3·0	80·5	+ 0·1
2 "	83·4	+ 3·3	80·6	+ 0·2
3 "	83·5	+ 3·4	80·7	+ 0·3
4 "	83·3	+ 3·2	80·8	+ 0·4
5 "	82·5	+ 2·4	80·9	+ 0·5
6 "	81·4	+ 1·3	80·8	+ 0·4
7 "	80·6	+ 0·5	80·7	+ 0·3
8 "	80·2	+ 0·1	80·7	+ 0·3
9 "	79·7	− 0·4	80·6	+ 0·2
10 "	79·3	− 0·8	80·6	+ 0·2
11 "	78·9	− 1·2	80·5	+ 0·1

	DEPTH. 1 Inch.	DEPTH. 9 Inches.
	°	°
Mean of hours from 10 P.M. to 9 A.M.	78·3	......
Ditto 10 A.M. to 9 P.M.	81·8	......
Ditto 1 A.M. to Noon	......	80·2
Ditto 1 P.M. to Midnight	......	80·7
Mean of 24 hours	80·1	80·4
Maximum at 3 P.M.	83·5	......
Ditto 5 P.M.	......	80·9
Minimum at 6 A.M.	77·2	......
Ditto 7 or 8 A.M.	......	80·0
Difference	6·3	0·9

Temperature of Evaporation, 1868.

TABLE VII.—*Mean Temperature of Evaporation for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1868.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	63·2	...	72·4	75·7	81·4	77·6	77·8	76·0	78·3	...	70·0
2	69·9	...	68·0	73·4	76·4	80·5	77·6	...	76·1	77·2	77·8	70·9
3	70·8	64·4	64·8	74·9	...	79·9	76·0	...	76·0	78·2	75·3	69·7
4	69·5	65·7	65·3	75·0	78·7	77·9	78·0	77·3	76·0	...	75·3	68·1
5	...	65·2	62·7	...	79·1	79·1	...	76·8	76·3	76·6	73·2	68·7
6	61·6	66·5	58·3	74·9	78·5	80·9	78·4	77·5	...	77·6	72·3	...
7	62·2	66·1	...	75·7	77·5	...	77·8	78·1	75·8	77·1	69·9	68·7
8	66·7	65·9	...	76·3	77·7	78·9	77·9	77·2	75·2	76·4	...	68·5
9	68·7	...	68·6	76·9	77·9	80·4	78·2	...	75·8	75·9	69·1	68·2
10	69·5	69·6	70·2	...	...	80·3	78·6	76·2	75·9	77·3	71·2	68·7
11	67·5	69·9	70·4	75·3	78·1	78·9	78·2	76·6	75·5	...	71·4	68·5
12	...	69·5	70·5	...	77·6	79·4	...	76·2	75·1	77·0	73·3	68·1
13	67·0	68·3	70·4	74·9	77·4	79·9	76·7	76·3	...	76·6	73·4	...
14	69·4	68·5	70·5	75·7	77·4	...	75·3	76·2	76·1	75·4	72·4	67·5
15	69·8	69·7	...	76·0	78·7	78·1	75·5	76·6	76·3	75·1	...	68·6
16	69·3	...	69·9	75·4	79·2	78·4	75·7	...	76·2	76·0	69·8	71·2
17	64·5	73·0	71·7	73·1	...	79·3	77·5	76·4	76·5	...	69·7	70·9
18	62·4	72·6	72·0	74·4	79·7	79·6	77·8	76·0	77·0	...	68·8	68·5
19	...	71·2	72·5	...	78·6	79·1	...	76·9	76·9	77·4	68·6	68·0
20	67·2	71·8	70·7	76·3	78·1	78·8	77·4	76·8	...	77·8	69·2	...
21	66·7	...	70·6	75·9	78·6	...	77·3	76·6	77·2	78·5	68·5	69·1
22	65·4	71·7	...	74·7	78·2	79·0	77·5	76·3	77·1	78·1	...	68·7
23	60·9	...	71·6	74·5	...	78·7	76·4	...	76·7	77·6	69·3	66·9
24	63·2	69·8	72·2	76·8	...	78·6	77·6	76·3	77·0	75·6	70·2	67·1
25	69·3	69·9	73·5	76·2	77·4	78·6	78·2	75·9	76·0	...	70·8	...
26	...	70·8	75·0	...	78·4	78·1	...	75·5	76·6	75·8	71·4	70·2
27	69·9	74·1	76·1	78·7	79·4	78·2	77·3	76·2	...	78·0	70·9	...
28	63·9	74·0	74·9	77·5	80·0	...	76·8	76·2	78·2	76·5	70·4	69·2
29	65·6	73·3	...	75·2	80·4	78·1	76·4	76·1	77·7	76·0	...	67·4
30	65·4		72·4	76·0	81·2	78·0	76·6	...	76·2	74·6	70·8	65·6
31	61·0		72·9		...		77·0	74·9		73·0		66·9
Monthly Mean.	66·4	69·4	70·2	75·4	78·4	79·2	77·2	76·5	76·4	76·7	71·3	68·6
Annual Variation.	− 7·4	− 4·4	− 3·6	+ 1·6	+ 4·6	+ 5·4	+ 3·4	+ 2·7	+ 2·6	+ 2·9	− 2·5	− 5·2

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Mean of months from January to April, November and December	70·2
Mean of months from May to October	77·4
Mean for the Year...	73·8
The greatest monthly mean (that of June)	79·2
The least monthly mean (that of January)	66·4
Difference	12·8

Temperature of Evaporation, 1868.

TABLE VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1868.	MONTH.												Year.
Bombay Civil Time.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 1·0	− 0·9	+ 0·1	− 0·3	− 0·8	− 0·8	− 0·7	− 0·3	− 0·7	− 0·9	− 0·3	− 0·4	− 0·6
1 A.M.	− 1·1	− 1·1	+ 0·1	− 0·5	− 1·1	− 0·8	− 0·8	− 0·4	− 0·8	− 1·1	− 0·8	− 0·9	− 0·8
2 "	− 1·6	− 1·5	− 0·3	− 0·7	− 1·3	− 0·9	− 0·8	− 0·5	− 0·9	− 1·4	− 1·4	− 1·4	− 1·1
3 "	− 2·2	− 1·9	− 1·0	− 0·9	− 1·5	− 1·1	− 0·7	− 0·6	− 1·0	− 1·4	− 2·0	− 1·6	− 1·3
4 "	− 2·9	− 2·0	− 1·4	− 1·7	− 1·7	− 1·0	− 0·9	− 1·0	− 1·3	− 1·8	− 1·9	− 2·1	− 1·6
5 "	− 3·0	− 2·7	− 1·8	− 2·1	− 1·7	− 1·0	− 1·2	− 0·8	− 1·5	− 1·8	− 2·3	− 2·6	− 1·9
6 "	− 3·2	− 3·1	− 2·1	− 2·2	− 1·5	− 1·3	− 1·0	− 0·9	− 1·4	− 2·1	− 2·5	− 2·8	− 2·0
7 "	− 3·2	− 2·7	− 1·8	− 1·2	− 0·7	− 0·9	− 0·6	− 0·8	− 0·8	− 1·1	− 2·3	− 3·0	− 1·6
8 "	− 2·0	− 1·8	− 1·2	− 0·6	− 0·3	− 0·3	− 0·1	− 0·4	− 0·1	− 0·4	− 2·1	− 2·2	− 1·0
9 "	− 0·8	− 1·0	− 0·8	+ 0·1	+ 0·1	+ 0·3	+ 0·3	+ 0·4	+ 0·4	+ 0·3	− 1·2	− 2·1	− 0·3
10 "	− 0·3	− 0·3	− 0·6	+ 0·9	+ 0·2	+ 0·5	+ 0·9	+ 0·6	+ 0·9	+ 0·4	− 1·1	− 1·3	+ 0·1
11 "	+ 0·5	+ 0·5	+ 0·4	+ 1·5	+ 0·6	+ 0·7	+ 1·4	+ 0·9	+ 1·4	+ 0·2	− 0·7	− 0·6	+ 0·6
Noon.	+ 1·7	+ 1·3	+ 1·1	+ 1·8	+ 1·1	+ 1·4	+ 1·4	+ 1·0	+ 1·4	+ 1·0	− 0·4	+ 0·3	+ 1·1
1 P.M.	+ 2·7	+ 2·5	+ 1·7	+ 2·0	+ 1·5	+ 1·7	+ 1·7	+ 1·4	+ 1·7	+ 1·5	+ 0·8	+ 1·7	+ 1·7
2 "	+ 3·4	+ 2·8	+ 1·9	+ 1·8	+ 1·7	+ 1·4	+ 1·4	+ 1·4	+ 1·7	+ 1·9	+ 2·1	+ 2·4	+ 2·0
3 "	+ 3·6	+ 3·2	+ 1·9	+ 1·6	+ 1·8	+ 1·5	+ 1·4	+ 1·0	+ 1·5	+ 2·2	+ 2·6	+ 3·0	+ 2·1
4 "	+ 3·6	+ 3·2	+ 1·9	+ 1·5	+ 1·6	+ 1·1	+ 1·0	+ 0·7	+ 1·2	+ 2·1	+ 3·6	+ 3·3	+ 2·1
5 "	+ 2·4	+ 2·4	+ 1·6	+ 0·9	+ 1·4	+ 0·7	+ 0·4	+ 0·3	+ 0·5	+ 1·6	+ 2·8	+ 2·6	+ 1·5
6 "	+ 1·8	+ 1·4	+ 0·8	+ 0·2	+ 0·8	+ 0·3	0·0	0·0	− 0·1	+ 1·0	+ 2·6	+ 2·5	+ 0·9
7 "	+ 1·6	+ 0·9	+ 0·1	− 0·1	+ 0·5	− 0·5	− 0·4	− 0·3	− 0·6	+ 0·7	+ 2·6	+ 2·4	+ 0·6
8 "	+ 1·2	+ 0·3	+ 0·1	− 0·2	+ 0·1	− 0·4	− 0·2	− 0·3	− 0·6	+ 0·5	+ 2·1	+ 2·2	+ 0·4
9 "	+ 0·6	+ 0·4	+ 0·2	− 0·3	− 0·1	− 0·4	− 0·6	− 0·2	− 0·8	− 0·1	+ 1·0	+ 1·5	+ 0·1
10 "	0·0	− 0·1	− 0·1	− 0·3	− 0·2	− 0·6	− 0·6	− 0·3	− 0·8	− 0·8	− 0·4	0·0	− 0·3
11 "	− 0·9	− 0·5	− 0·4	− 0·2	− 0·5	− 0·6	− 0·6	− 0·4	− 0·7	− 1·0	− 0·3	− 0·7	− 0·6

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Mean of the hours from 10 P.M. to 9 A.M.	72·7
Mean of the hours from 10 A.M. to 9 P.M.	74·9
Mean of 24 hours	73·8

In the Mean Diurnal Variation for the year a Maximum occurs between 3 and 4 P.M., and a Minimum at 6 A.M.

Temperature of Dew-point, 1868.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1868. Date.	MONTHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	58·7	...	70·1	73·4	80·0	76·3	76·8	75·0	77·2	...	67·1
2	67·2	...	64·4	71·4	74·5	78·6	76·0	...	74·4	76·1	75·9	67·6
3	68·9	60·9	59·2	72·7	...	77·8	75·0	...	74·4	77·0	72·0	64·9
4	67·2	62·9	60·3	72·3	76·6	75·9	76·8	76·1	74·3	...	72·7	62·3
5	...	62·0	55·7	...	77·2	77·6	...	75·8	74·8	75·1	69·9	63·6
6	56·1	63·3	46·9	71·5	76·5	79·3	76·6	76·7	...	76·4	69·0	...
7	57·6	63·0	...	73·2	75·2	...	76·0	77·2	74·5	75·9	65·1	64·6
8	64·3	62·4	...	74·3	75·6	78·1	76·1	76·6	73·8	75·1	...	64·6
9	66·4	...	66·2	75·1	75·9	79·8	76·5	...	74·5	74·5	64·6	64·4
10	67·9	67·5	68·3	...	...	79·4	76·8	75·6	74·4	76·1	68·2	65·5
11	64·9	68·1	68·4	72·9	75·7	78·4	76·8	75·6	73·8	...	68·7	65·1
12	...	67·7	67·8	...	75·2	78·3	...	75·2	73·1	74·7	71·3	64·7
13	63·7	65·8	67·6	72·5	75·1	78·3	76·2	75·5	...	74·5	71·6	...
14	66·3	66·0	68·3	73·4	74·9	...	74·8	75·1	74·3	73·0	69·9	64·4
15	67·0	67·4	...	74·1	76·8	77·0	74·9	75·3	74·6	72·4	...	66·1
16	66·9	...	67·8	72·7	77·2	77·6	75·3	...	74·8	74·3	65·1	68·9
17	58·8	71·1	69·5	68·7	...	77·9	76·7	75·2	75·0	...	64·7	68·3
18	56·9	70·8	69·7	71·0	77·6	78·2	76·9	75·0	75·5	...	64·2	64·7
19	...	68·7	70·5	...	76·4	77·5	...	75·6	75·6	76·2	64·4	64·2
20	63·9	70·2	68·0	74·4	75·6	77·4	76·4	75·3	...	76·4	65·5	...
21	63·5	...	67·5	73·6	76·3	...	76·5	75·2	75·9	77·2	63·8	66·0
22	61·8	69·6	...	71·7	75·9	77·5	76·6	74·5	76·1	76·6	...	65·5
23	55·1	...	67·9	72·0	...	77·1	75·8	...	75·5	76·0	65·3	63·2
24	59·2	67·7	68·8	75·0	...	77·4	76·6	74·7	76·0	73·6	66·6	63·5
25	67·3	67·7	71·3	73·4	74·6	77·0	77·0	74·1	75·0	...	67·9	...
26	...	67·5	73·0	...	75·9	76·6	...	74·1	75·3	74·2	68·5	67·7
27	67·7	71·6	74·5	77·1	77·3	76·7	75·9	74·9	...	76·6	67·4	...
28	59·3	71·4	72·8	75·9	78·1	...	75·8	75·1	77·1	74·3	66·3	66·6
29	61·9	70·2	...	72·5	78·7	76·6	75·7	74·7	76·9	73·1	...	63·5
30	61·6		69·8	73·6	79·7	76·7	75·9	...	75·1	72·0	68·0	61·1
31	54·3		70·9		...		76·1	74·3		69·5		63·9
Monthly Mean.	62·9	66·8	67·0	73·0	76·2	77·8	76·1	75·4	75·0	74·9	67·9	65·1
Annual Variation.	− 8·6	− 4·7	− 4·5	+ 1·5	+ 4·7	+ 6·3	+ 4·6	+ 3·9	+ 3·5	+ 3·4	− 3·6	− 6·4

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Mean of months from January to April, November and December	67·1
Mean of months from May to October	75·9
Mean for the Year	71·5
The greatest monthly mean (that of June)	77·8
The least monthly mean (that of January)	62·9
Difference	14·9

Temperature of Dew-point, 1868.

TABLE X.—*The Mean Diurnal Variation of the Temperature of the Dew-point for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Dew-point above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 0·1	0·0	+ 1·4	+ 0·5	− 0·2	− 0·5	− 0·5	− 0·1	− 0·4	− 0·2	+ 0·8	+ 0·7	+ 0·1
1 A.M.	− 0·2	− 0·2	+ 1·6	+ 0·3	− 0·4	− 0·6	− 0·6	− 0·2	− 0·4	− 0·4	+ 0·3	+ 0·2	0·0
2 "	− 0·7	− 0·5	+ 1·2	+ 0·2	− 0·7	− 0·5	− 0·7	− 0·3	− 0·4	− 0·7	− 0·4	− 0·4	− 0·3
3 "	− 1·5	− 0·9	+ 0·5	+ 0·1	− 0·8	− 0·8	− 0·5	− 0·3	− 0·5	− 0·6	− 1·2	− 0·5	− 0·6
4 "	− 2·5	− 0·8	0·0	− 1·0	− 1·0	− 0·6	− 0·6	− 0·8	− 0·8	− 1·0	− 0·9	− 1·2	− 0·9
5 "	− 2·4	− 1·7	− 0·4	− 1·4	− 0·9	− 0·6	− 0·9	− 0·6	− 0·9	− 0·9	− 1·3	− 1·8	− 1·1
6 "	− 2·4	− 2·2	− 0·8	− 1·4	− 0·6	− 0·9	− 0·7	− 0·7	− 0·8	− 1·1	− 1·2	− 1·8	− 1·2
7 "	− 2·6	− 1·7	− 0·7	− 0·9	− 0·3	− 0·6	− 0·4	− 0·6	− 0·3	− 0·3	− 1·3	− 2·2	− 1·0
8 "	− 1·8	− 1·5	− 1·2	− 0·9	− 0·3	− 0·2	0·0	− 0·3	+ 0·3	0·0	− 2·0	− 1·9	− 0·8
9 "	− 1·1	− 1·3	− 1·8	− 0·4	− 0·2	+ 0·4	+ 0·5	+ 0·3	+ 0·7	+ 0·5	− 1·4	− 2·8	− 0·5
10 "	− 1·4	− 1·2	− 2·6	+ 0·4	− 0·4	+ 0·3	+ 0·9	+ 0·5	+ 1·0	0·0	− 2·2	− 2·4	− 0·6
11 "	− 1·1	− 1·1	− 1·3	+ 0·9	− 0·2	+ 0·3	+ 1·3	+ 0·7	+ 1·4	− 0·8	− 2·8	− 2·2	− 0·4
Noon.	− 0·1	− 0·6	− 0·6	+ 1·0	+ 0·2	+ 1·0	+ 1·2	+ 0·5	+ 1·0	− 0·4	− 3·5	− 2·1	− 0·2
1 P.M.	+ 1·2	+ 1·1	+ 0·1	+ 1·0	+ 0·4	+ 1·3	+ 1·3	+ 0·9	+ 1·2	+ 0·2	− 2·2	− 0·9	+ 0·5
2 "	+ 1·9	+ 1·4	+ 0·4	+ 0·7	+ 0·7	+ 1·1	+ 1·1	+ 1·0	+ 1·1	+ 0·5	− 0·5	0·0	+ 0·8
3 "	+ 2·3	+ 1·9	+ 0·5	+ 0·3	+ 0·9	+ 1·2	+ 1·0	+ 0·4	+ 0·8	+ 1·0	+ 0·5	+ 0·9	+ 1·0
4 "	+ 2·7	+ 2·2	+ 0·7	+ 0·5	+ 0·8	+ 0·9	+ 0·6	+ 0·2	+ 0·4	+ 1·1	+ 2·7	+ 2·1	+ 1·2
5 "	+ 2·0	+ 1·8	+ 0·6	0·0	+ 0·9	+ 0·6	+ 0·2	0·0	− 0·1	+ 1·1	+ 2·7	+ 2·3	+ 1·0
6 "	+ 2·1	+ 1·3	+ 0·5	− 0·1	+ 0·8	+ 0·3	− 0·1	− 0·1	− 0·4	+ 0·9	+ 3·2	+ 3·0	+ 0·9
7 "	+ 2·1	+ 1·1	0·0	− 0·2	+ 0·7	− 0·5	− 0·4	− 0·2	− 0·8	+ 1·0	+ 3·5	+ 3·2	+ 0·8
8 "	+ 1·8	+ 0·6	+ 0·2	− 0·1	+ 0·6	− 0·3	− 0·2	− 0·3	− 0·6	+ 0·9	+ 3·1	+ 3·2	+ 0·7
9 "	+ 1·3	+ 0·9	+ 0·7	+ 0·1	+ 0·4	− 0·3	− 0·5	− 0·1	− 0·7	+ 0·3	+ 1·9	+ 2·6	+ 0·5
10 "	+ 0·7	+ 0·5	+ 0·6	+ 0·2	+ 0·4	− 0·5	− 0·5	− 0·2	− 0·7	− 0·4	+ 0·4	+ 1·0	+ 0·1
11 "	− 0·2	+ 0·2	+ 0·5	+ 0·3	+ 0·1	− 0·4	− 0·5	− 0·3	− 0·4	− 0·4	+ 0·8	+ 0·2	0·0

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Mean of the hours from 1 A.M. to Noon	70·9
Mean of the hours from 1 P.M. to Midnight..................	72·1
Mean for 24 hours..	71·5

In the Mean Diurnal Variation for the year a Maximum occurs at 4 P.M., and a Minimum at 6 A.M.

Maxima and Minima of different Meteorological Elements, 1868.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1868, *which showed the greatest and the least values of the following elements, viz., Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1868. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	°	°	°	°	°	°	°	°	°
January	30·064	29·781	0·283	85·9	62·2	23·7	75·2	53·3	21·9	73·0	45·6	27·4
February	·070	·742	·328	91·3	63·9	27·4	80·2	57·7	22·5	77·9	53·4	24·5
March	·005	·760	·245	86·7	64·7	22·0	78·3	52·0	26·3	76·2	51·6	24·6
April	·053	·705	·348	89·6	73·0	16·6	80·8	68·5	12·3	78·4	60·7	17·7
May	29·934	·582	·352	90·7	76·6	14·1	82·6	73·1	9·5	80·4	71·6	8·8
June...........	·831	·344	·487	92·5	76·6	15·9	83·9	74·3	9·6	82·0	72·3	9·7
July...........	·868	·561	·307	88·2	71·9	16·3	81·0	71·5	9·5	79·5	71·3	8·2
August.........	·903	·544	·359	85·4	75·1	10·3	80·4	73·3	7·1	78·9	71·6	7·3
September ...	·928	·701	·227	87·1	74·7	12·4	81·4	73·3	8·1	79·8	71·1	7·9
October	·981	·756	·225	91·3	74·5	16·8	82·0	68·5	13·5	80·0	62·5	17·5
November ...	30·090	·740	·350	90·3	70·7	19·6	81·2	63·3	17·9	79·6	54·0	25·6
December ...	·131	·829	·302	89·5	67·2	22·3	75·3	59·4	15·9	72·7	50·3	22·4
Year...........	30·131	29·344	0·787	92·5	62·2	30·3	83·9	52·0	31·9	82·0	45·6	36·4

Pressure of Vapour, 1868.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time: also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1868. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·497	...	0·736	0·822	1·023	0·906	0·922	0·867	0·934	...	0·664
2	0·668	...	0·606	·770	·854	0·981	0·898	...	·851	·900	·894	·677
3	·705	·539	·507	·803	...	·955	·868	...	·850	·928	·789	·622
4	·667	·573	·526	·794	·915	·897	·921	·902	·848	...	·806	·570
5	...	·555	·448	...	·934	·947	...	·892	·861	·870	·734	·598
6	·456	·583	·335	·778	·912	1·002	·917	·920	...	·910	·710	...
7	·485	·577	...	·819	·873	...	·898	·933	·853	·893	·622	·612
8	·605	·571	...	·849	·885	0·962	·900	·915	·833	·871	...	·612
9	·653	...	·644	·872	·894	1·017	·913	...	·853	·853	·613	·606
10	·683	·674	·691	...	...	1·004	·923	·885	·851	·903	·692	·628
11	·616	·689	·695	·810	·889	0·970	·920	·885	·835	...	·702	·621
12	...	·677	·682	...	·873	·968	...	·874	·814	·859	·768	·612
13	·598	·634	·678	·799	·871	·967	·904	·882	...	·855	·773	...
14	·647	·640	·692	·822	·864	...	·862	·872	·848	·814	·731	·604
15	·664	·676	...	·842	·920	·929	·865	·877	·857	·799	...	·641
16	·660	...	·682	·794	·935	·945	·876	...	·862	·848	·627	·706
17	·508	·764	·722	·702	...	·955	·917	·874	·867	...	·618	·693
18	·465	·755	·726	·760	·945	·966	·923	·868	·882	...	·603	·613
19	...	·704	·745	...	·908	·942	...	·886	·885	·903	·606	·605
20	·599	·739	·686	·850	·886	·938	·909	·878	...	·909	·631	...
21	·590	...	·673	·828	·906	...	·913	·875	·896	·936	·599	·640
22	·553	·725	...	·776	·896	·945	·917	·852	·900	·915	...	·629
23	·437	...	·684	·784	...	·931	·893	...	·882	·897	·625	·581
24	·513	·679	·707	·868	...	·939	·916	·860	·897	·829	·656	·588
25	·672	·680	·767	·826	·857	·928	·928	·843	·868	...	·684	...
26	...	·677	·814	...	·895	·916	...	·842	·876	·846	·701	·679
27	·683	·784	·852	·932	·938	·917	·895	·864	...	·916	·673	...
28	·510	·775	·806	·894	·962	...	·891	·870	·933	·849	·650	·653
29	·554	·741	...	·799	·981	·917	·888	·858	·924	·819	...	·586
30	·549		·729	·829	1·012	·918	·894	...	·872	·788	·686	·544
31	·429		·755		...		·899	·849		·722		·595
Monthly Mean.	0·583	0·663	0·674	0·814	0·905	0·953	0·902	0·879	0·868	0·868	0·688	0·622
Annual Variation.	−0·202	−0·122	−0·111	+0·029	+0·120	+0·168	+0·117	+0·094	+0·083	+0·083	−0·097	−0·163

	in.
Mean of months from January to April, November and December	0·674
Mean of months from May to October	0·896
Mean for the Year	0·785
The greatest monthly mean (that of June)	0·953
The least monthly mean (that of January)	0·583
Difference	0·370

Pressure of Vapour, 1868.

TABLE XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	−0·003	+0·001	+0·025	+0·012	−0·006	−0·016	−0·016	−0·003	−0·011	−0·007	+0·017	+0·015	+0·001
1 A.M.	− ·004	− ·003	+ ·030	+ ·008	− ·014	− ·019	− ·020	− ·005	− ·011	− ·011	+ ·008	+ ·003	− ·003
2 „	− ·014	− ·009	+ ·021	+ ·004	− ·022	− ·017	− ·021	− ·009	− ·011	− ·017	− ·012	− ·009	− ·010
3 „	− ·029	− ·016	+ ·003	+ ·001	− ·025	− ·026	− ·015	− ·008	− ·013	− ·019	− ·029	− ·011	− ·016
4 „	− ·046	− ·017	− ·009	− ·027	− ·035	− ·016	− ·021	− ·022	− ·023	− ·030	− ·021	− ·026	− ·024
5 „	− ·045	− ·038	− ·016	− ·039	− ·028	− ·020	− ·029	− ·016	− ·027	− ·026	− ·030	− ·039	− ·029
6 „	− ·046	− ·050	− ·022	− ·038	− ·020	− ·028	− ·022	− ·020	− ·023	− ·035	− ·029	− ·038	− ·031
7 „	− ·048	− ·040	− ·018	− ·022	− ·010	− ·019	− ·014	− ·018	− ·008	− ·010	− ·031	− ·046	− ·024
8 „	− ·032	− ·033	− ·024	− ·022	− ·010	− ·004	− ·001	− ·009	+ ·008	− ·002	− ·046	− ·040	− ·018
9 „	− ·020	− ·031	− ·032	− ·011	− ·008	+ ·011	+ ·013	+ ·011	+ ·021	+ ·012	− ·033	− ·058	− ·010
10 „	− ·028	− ·028	− ·043	+ ·010	− ·012	+ ·010	+ ·027	+ ·017	+ ·029	·000	− ·051	− ·050	− ·010
11 „	− ·022	− ·027	− ·018	+ ·024	− ·006	+ ·011	+ ·039	+ ·021	+ ·040	− ·019	− ·059	− ·046	− ·005
Noon.	− ·005	− ·015	− ·008	+ ·026	+ ·004	+ ·033	+ ·036	+ ·014	+ ·031	− ·007	− ·072	− ·042	·000
1 P.M.	+ ·022	+ ·026	+ ·004	+ ·026	+ ·011	+ ·042	+ ·039	+ ·027	+ ·035	+ ·005	− ·046	− ·016	+ ·015
2 „	+ ·037	+ ·034	+ ·008	+ ·018	+ ·020	+ ·033	+ ·031	+ ·030	+ ·032	+ ·015	− ·007	+ ·003	+ ·021
3 „	+ ·046	+ ·046	+ ·010	+ ·007	+ ·027	+ ·039	+ ·030	+ ·014	+ ·024	+ ·027	+ ·014	+ ·019	+ ·025
4 „	+ ·054	+ ·054	+ ·013	+ ·012	+ ·024	+ ·027	+ ·016	+ ·007	+ ·013	+ ·030	+ ·062	+ ·046	+ ·030
5 „	+ ·040	+ ·042	+ ·015	·000	+ ·026	+ ·017	+ ·004	+ ·001	− ·003	+ ·028	+ ·062	+ ·051	+ ·024
6 „	+ ·042	+ ·031	+ ·013	− ·003	+ ·023	+ ·010	− ·006	− ·001	− ·011	+ ·025	+ ·076	+ ·066	+ ·022
7 „	+ ·041	+ ·024	+ ·002	− ·006	+ ·021	− ·016	− ·012	− ·006	− ·021	+ ·026	+ ·082	+ ·072	+ ·017
8 „	+ ·036	+ ·011	+ ·006	− ·002	+ ·017	− ·011	− ·006	− ·007	− ·018	+ ·025	+ ·072	+ ·072	+ ·016
9 „	+ ·025	+ ·020	+ ·017	+ ·001	+ ·011	− ·010	− ·017	− ·002	− ·021	+ ·010	+ ·042	+ ·057	+ ·011
10 „	+ ·005	+ ·009	+ ·013	+ ·005	+ ·010	− ·015	− ·017	− ·004	− ·019	− ·011	+ ·006	+ ·020	·000
11 „	− ·005	+ ·004	+ ·010	+ ·008	+ ·003	− ·013	− ·014	− ·009	− ·012	− ·011	+ ·017	+ ·003	− ·002

	in.
Mean of the hours from 1 A.M. to Noon	0·770
Mean of the hours from 1 P.M. to Midnight	0·800
Mean of 24 hours	0·785

In the Mean Diurnal Variation for the year a Maximum occurs at 4 P.M., and a Minimum at 6 A.M.

Relative Humidity of the Air, 1868.

TABLE XIV.—*Mean Relative Humidity of the Air for each Day of Bombay Civil Time: also the Monthly Mean Relative Humidity and its Variation from the Mean of the Year.*

1868.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	0·660	...	0·776	0·766	0·831	0·851	0·887	0·886	0·875	...	0·737
2	0·758	...	0·701	·798	·792	·791	·824	...	·821	·868	0·786	·716
3	·805	·717	·601	·778	...	·771	·892	...	·828	·869	·699	·646
4	·789	·763	·637	·746	·779	·780	·864	·870	·816	...	·750	·589
5	...	·733	·552	...	·789	·822	...	·888	·832	·833	·708	·629
6	·617	·736	·439	·691	·781	·817	·813	·909	...	·860	·698	...
7	·667	·741	...	·755	·762	...	·806	·894	·853	·863	·623	·671
8	·793	·714	...	·794	·769	·903	·802	·927	·851	·853	...	·689
9	·789	...	·780	·810	·780	·925	·815	...	·855	·846	·648	·697
10	·852	·802	·815	...	...	·887	·804	·928	·844	·871	·734	·715
11	·774	·827	·816	·768	·753	·930	·836	·889	·819	...	·749	·707
12	...	·827	·761	...	·743	·869	...	·884	·792	·760	·798	·712
13	·727	·776	·747	·757	·757	·814	·939	·905	...	·789	·815	...
14	·724	·785	·792	·763	·740	...	·934	·882	·808	·759	·767	·730
15	·747	·787	...	·799	·786	·881	·928	·861	·818	·748	...	·768
16	·775	...	·798	·709	·781	·897	·955	...	·842	·814	·629	·780
17	·630	·812	·799	·618	...	·834	·899	·863	·829	...	·627	·755
18	·612	·829	·789	·680	·768	·833	·892	·881	·835	...	·632	·675
19	...	·771	·801	...	·757	·815	...	·849	·853	·859	·655	·692
20	·725	·838	·756	·795	·742	·828	·880	·840	...	·837	·689	...
21	·748	...	·720	·770	·751	...	·906	·845	·863	·853	·645	·728
22	·709	·799	...	·714	·762	·829	·901	·803	·879	·830	...	·721
23	·595	...	·674	·755	....	·814	·938	...	·856	·824	·671	·696
24	·696	·810	·694	·807	...	·855	·886	·827	·883	·793	·691	·703
25	·807	·792	·782	·721	·715	·818	·861	·809	·892	...	·739	...
26	...	·709	·801	...	·741	·828	...	·846	·854	·828	·746	·766
27	·799	·788	·831	·820	·771	·828	·842	·849	...	·840	·696	...
28	·650	·762	·786	·823	·784	...	·887	·875	·878	·775	·665	·765
29	·697	·715	...	·737	·800	·837	·913	·846	·899	·732	...	·677
30	·687		·758	·759	·819	·845	·921	...	·882	·754	·744	·654
31	·562		·796				·893	·938		·689		·736
Monthly Mean.	·721	·770	·737	·758	·768	·842	·877	·872	·849	·816	·704	·706
Annual Variation.	−0·064	−0·015	−0·048	−0·027	−0·017	+0·057	+0·092	+0·087	+0·064	+0·031	−0·081	−0·079

Mean of the months from January to April, November and December	0·733
Mean of the months from May to October..	0·837
Mean for the Year...	0·785
The greatest monthly mean (that of July)	0·877
The least monthly mean (that of November)	0·704
Difference............	0·173

Relative Humidity of the Air, 1868.

TABLE XV.—*The Mean Diurnal Variation of Relative Humidity of the Air for each Month, and for the whole Year; or the Excess of the Mean Relative Humidity above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	+0·065	+0·070	+0·086	+0·072	+0·054	+0·028	+0·016	+0·025	+0·032	+0·063	+0·082	+0·077	+ ·056
1 A.M.	+ ·074	+ ·076	+ ·103	+ ·077	+ ·057	+ ·023	+ ·020	+ ·030	+ ·042	+ ·066	+ ·088	+ ·079	+ ·061
2 ”	+ ·073	+ ·086	+ ·098	+ ·080	+ ·058	+ ·033	+ ·021	+ ·025	+ ·047	+ ·062	+ ·076	+ ·074	+ ·061
3 ”	+ ·058	+ ·091	+ ·097	+ ·092	+ ·063	+ ·026	+ ·026	+ ·035	+ ·049	+ ·078	+ ·064	+ ·080	+ ·063
4 ”	+ ·044	+ ·099	+ ·094	+ ·075	+ ·064	+ ·033	+ ·027	+ ·027	+ ·047	+ ·073	+ ·081	+ ·071	+ ·061
5 ”	+ ·055	+ ·081	+ ·097	+ ·069	+ ·073	+ ·038	+ ·025	+ ·031	+ ·051	+ ·090	+ ·081	+ ·065	+ ·063
6 ”	+ ·064	+ ·081	+ ·098	+ ·075	+ ·079	+ ·036	+ ·027	+ ·024	+ ·057	+ ·081	+ ·096	+ ·075	+ ·066
7 ”	+ ·059	+ ·083	+ ·086	+ ·042	+ ·036	+ ·026	+ ·022	+ ·019	+ ·054	+ ·077	+ ·077	+ ·063	+ ·054
8 ”	+ ·030	+ ·027	+ ·010	− ·013	− ·008	+ ·016	+ ·014	+ ·013	+ ·037	+ ·029	+ ·011	+ ·026	+ ·016
9 ”	− ·016	− ·020	− ·051	− ·044	− ·033	− ·001	+ ·008	·000	+ ·024	+ ·011	− ·018	− ·037	− ·015
10 ”	− ·069	− ·070	− ·102	− ·049	− ·061	− ·028	+ ·003	− ·006	− ·001	− ·038	− ·071	− ·064	− ·046
11 ”	− ·099	− ·111	− ·101	− ·059	− ·077	− ·041	− ·013	− ·026	− ·015	− ·088	− ·122	− ·100	− ·071
Noon.	− ·117	− ·135	− ·111	− ·077	− ·090	− ·044	− ·023	− ·049	− ·046	− ·114	− ·172	− ·143	− ·093
1 P.M.	− ·117	− ·118	− ·115	− ·092	− ·102	− ·045	− ·038	− ·050	− ·059	− ·129	− ·179	− ·154	− ·100
2 ”	− ·110	− ·120	− ·119	− ·098	− ·099	− ·043	− ·046	− ·045	− ·070	− ·130	− ·159	− ·149	− ·101
3 ”	− ·105	− ·106	− ·114	− ·109	− ·093	− ·039	− ·040	− ·052	− ·080	− ·120	− ·143	− ·142	− ·095
4 ”	− ·083	− ·087	− ·099	− ·092	− ·080	− ·035	− ·043	− ·048	− ·082	− ·103	− ·086	− ·099	− ·078
5 ”	− ·040	− ·059	− ·078	− ·074	− ·055	− ·023	− ·020	− ·025	− ·067	− ·062	− ·029	− ·039	− ·048
6 ”	+ ·007	− ·011	− ·025	− ·027	− ·014	− ·004	− ·011	− ·002	− ·036	− ·016	+ ·025	+ ·016	− ·008
7 ”	+ ·027	+ ·009	− ·009	− ·002	+ ·024	− ·011	− ·006	+ ·007	− ·021	+ ·010	+ ·051	+ ·044	+ ·010
8 ”	+ ·037	+ ·011	+ ·014	+ ·019	+ ·038	·000	+ ·004	+ ·011	− ·004	+ ·030	+ ·062	+ ·063	+ ·024
9 ”	+ ·047	+ ·035	+ ·035	+ ·033	+ ·045	+ ·010	+ ·007	+ ·018	+ ·002	+ ·039	+ ·060	+ ·072	+ ·034
10 ”	+ ·056	+ ·044	+ ·048	+ ·044	+ ·053	+ ·012	+ ·012	+ ·019	+ ·009	+ ·037	+ ·051	+ ·060	+ ·037
11 ”	+ ·053	+ ·057	+ ·060	+ ·054	+ ·055	+ ·020	+ ·013	+ ·016	+ ·023	+ ·057	+ ·077	+ ·058	+ ·045

Mean of the hours from 8 A.M. to 7 P.M.	0·733
Mean of the hours from 8 P.M. to 7 A.M.	0·837
Mean of 24 hours	0·785

In the Mean Diurnal Variation for the year a Maximum occurs at 6 A.M., and a Minimum at 2 P.M.

Extent of Cloudy Sky, 1868.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time: also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1868. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...		...	0·5	1·5	5·3	6·8	6·3	6·3	7·4	...	4·2
2		...	0·2	0·5	0·7	7·0	5·4	...	5·0	7·0	7·1	4·7
3	0·2	0·2		0·7	...	6·9	7·4	...	5·4	6·8	6·5	5·0
4	0·4	0·1		0·1	2·1	7·6	6·8	7·7	6·0	...	4·4	1·6
5	...	1·8		...	0·9	7·9	...	7·4	5·7	3·0	2·2	3·7
6	0·2	5·6		0·2	1·0	7·4	4·6	7·5	...	2·5		...
7		6·7	...	0·2	2·9	...	3·0	7·5	6·2	3·4		0·1
8	2·2	2·4	...	0·4	2·0	8·0	3·8	8·0	4·4	5·2	...	0·7
9	0·8	...		2·3	2·2	7·7	4·8	...	5·4	2·6	1·3	1·7
10	3·0	2·5	1·8	...	...	8·0	6·7	8·0	7·5	4·0		0·9
11		2·9		4·3	2·7	8·0	7·0	8·0	7·5	...		1·5
12	...	2·3		...	1·8	8·0	...	8·0	3·5	1·1		0·4
13	0·2	2·0	0·3	1·7	2·6	6·7	8·0	8·0	...			...
14	1·5	0·8	1·1	0·9	1·8	...	8·0	8·0	5·1			2·8
15	0·1		...	4·0	2·2	7·9	8·0	7·8	6·7	0·6	...	2·5
16	0·1	...	0·3	2·7	1·5	7·9	8·0	...	5·5	1·3		0·3
17		2·5	1·8	3·2	...	7·8	8·0	7·8	5·3			0·4
18	0·2	2·5	0·5	1·9	2·9	7·0	8·0	8·0	4·7	...		
19	...	0·2	1·7	...	2·3	5·1	...	7·4	7·7	4·5		
20	1·2	1·1	0·8	1·1	3·0	6·7	6·5	6·2	...	3·3		...
21	0·7			2·1	2·1	...	7·0	6·0	5·1	3·1	1·3	0·3
22	0·8	0·3	...	1·6	2·2	6·0	8·0	7·0	4·2	0·7	...	2·0
23	1·1	...	0·6	0·4	...	7·0	8·0	...	4·2	2·6	0·1	
24	2·5	1·0	1·0	0·6	...	6·5	7·8	4·4	7·1	0·8	4·3	0·5
25	2·7	0·4	5·4		1·4	7·0	6·7	5·5	7·5	...	6·0	...
26	...		6·5	...	2·4	6·5	...	6·7	6·5	0·2		0·5
27	1·1	0·3	1·8	2·1	3·3	7·0	7·8	5·8	...	4·0	1·3	...
28	0·3		1·2	0·4	5·4	...	8·0	7·3	4·2	7·0	4·2	0·2
29	0·9		...	0·7	3·9	7·6	8·0	6·7	8·0	5·1	...	1·4
30	0·5		0·9	4·5	6·7	7·0	8·0	...	7·2	3·8	5·1	
31			0·5		...		8·0	8·0		2·9		0·1
Monthly Mean.	0·8	1·5	1·1	1·5	2·5	7·1	7·0	7·2	5·8	3·2	1·8	1·4
Annual Variation.	− 2·6	− 1·9	− 2·3	− 1·9	− 0·9	+ 3·7	+ 3·6	+ 3·8	+ 2·4	− 0·2	− 1·6	− 2·0

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December.........	1·3
Mean of the months from May to October	5·5
Mean for the Year	3·4
The greatest monthly mean (that of August)	7·2
The least monthly mean (that of January)	0·8
Difference............	6·4

Extent of Cloudy Sky, 1868.

Table XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1868.	MONTH.												Year.
Bombay Civil Time.	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	0·1	0·8	1·2	1·5	3·1	6·6	7·3	7·3	6·1	2·2	2·0	0·9	3·6
1 A.M.	0·4	1·2	0·7	2·0	3·4	6·7	7·4	7·3	6·3	2·6	1·9	1·0	3·4
2 "	0·3	1·1	1·3	2·0	3·5	6·6	7·3	6·9	5·7	2·6	1·6	1·0	3·3
3 "	0·6	0·8	1·4	2·4	3·5	6·3	7·3	7·2	6·2	2·4	1·7	1·0	3·4
4 "	0·7	0·8	1·0	1·6	2·7	7·0	6·9	6·8	5·5	2·7	1·4	1·2	3·2
5 "	0·8	0·6	1·4	2·4	3·1	7·8	7·0	7·1	6·2	3·2	1·4	1·1	3·5
6 "	0·9	1·1	2·8	2·8	3·7	7·7	6·9	7·6	6·7	3·7	1·9	1·8	4·0
7 "	1·1	1·7	2·0	2·0	4·2	7·3	6·7	7·2	6·6	4·0	2·1	2·0	3·9
8 "	1·2	1·7	1·6	2·3	4·0	7·2	6·6	7·1	6·5	3·1	1·9	1·7	3·7
9 "	0·8	2·3	1·1	2·2	2·9	7·0	6·7	6·5	6·6	3·4	1·9	1·7	3·6
10 "	1·0	1·8	1·0	2·0	1·7	6·9	7·0	6·8	6·1	3·9	2·0	1·5	3·5
11 "	1·5	1·5	0·8	1·2	1·1	7·2	7·1	6·8	5·9	4·0	2·1	1·3	3·4
Noon.	1·5	1·6	0·8	1·0	1·0	7·3	7·0	6·8	6·1	3·7	2·0	1·7	3·4
1 P.M.	1·6	2·2	1·0	1·2	0·8	6·9	6·8	6·8	6·1	4·0	1·9	1·7	3·4
2 "	1·5	2·2	1·0	1·5	1·0	7·0	6·9	7·0	5·9	4·2	2·0	1·9	3·5
3 "	1·5	2·4	1·0	1·4	1·2	7·0	6·7	7·2	5·5	4·0	1·8	1·8	3·5
4 "	1·3	2·2	0·8	1·3	1·3	7·2	6·9	7·1	6·1	3·9	1·8	2·0	3·5
5 "	0·8	2·5	0·8	0·9	2·4	7·5	7·0	7·4	5·9	3·9	1·8	2·6	3·6
6 "	0·9	2·7	1·1	0·8	2·7	7·7	7·4	7·8	6·3	4·1	1·8	1·7	3·7
7 "	0·4	1·1	0·9	0·8	2·2	7·9	7·2	7·5	4·8	2·3	1·5	0·7	3·1
8 "	0·1	0·9	0·5	0·4	1·6	7·5	6·4	7·6	4·5	2·1	1·7	0·7	2·8
9 "	0·2	0·6	0·6	0·8	2·7	7·1	6·6	7·6	4·6	2·0	1·3	0·6	2·9
10 "	0·2	0·8	0·6	0·6	2·6	7·1	7·0	7·3	4·6	2·2	1·4	0·4	2·9
11 "	0·3	0·8	0·6	0·6	3·1	6·8	7·3	7·4	5·3	2·2	1·3	0·6	3·0

Rainfall, 1868.

TABLE XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day and each Month of the year.*

1868. Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
			in.			in.	in.	in.	in.	in.	in.	
1						0·03	0·27	0·50	0·35	0·14		
2						0·02	0·03	0·01				
3						0·02	1·05	0·39	0·03		0·02	
4						0·10	0·13	0·18	0·01			
5						0·05	0·01	0·57	0·09			
6								0·78	0·72			
7						3·03		0·04	0·08			
8						0·37	0·02	0·41	0·72			
9						2·22	0·51	10·23				
10						0·21		1·73	0·07			
11						2·10	0·23	0·08				
12						0·25	0·74	0·21				
13						0·01	1·91	0·27	0·02			
14						0·19	0·81	0·06				
15						0·55	1·84		0·01			
16						1·63	4·68	0·07	1·03			
17						0·15	0·75	0·03				
18						0·02	0·20	0·06				
19						0·19	0·35	0·02	0·02			
20						0·21	0·07		0·80			
21						0·02	0·34		0·06			
22						0·10	0·31		0·33			
23						0·16	0·87	0·09	0·30			
24						0·31	0·57	0·01	1·12			
25						0·05	0·12		1·22			
26			0·01			0·09	0·05	0·38	0·21			
27						0·27	0·12	0·29				
28						0·02	1·23	0·74	0·01			
29						0·19	1·71	0·14	0·51			
30						0·96	1·07	0·13				
31							0·44	2·87				
Monthly Total.			0·01			13·52	20·43	20·29	7·71	0·14	0·02	
No. of rainy days.			1			29	28	26	21	1	1	

Total fall of rain in the year .... 62·12 inches.
Total number of rainy days in the year 107
The greatest fall of rain in one month (July) .... 20·43 inches.

No rain fell in the months January, February, April, May and December, nor on any of the days left blank in the above table.

Rainfall, 1868.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
			in.			in.	in.	in.	in.	in.	in.		in.
12 to 1 A.M.						0·05	0·79	0·08	0·12				1·04
1 „ 2 „						0·28	1·11	0·57	0·19		0·02		2·17
2 „ 3 „						0·36	0·29	0·17	0·01				0·83
3 „ 4 „						0·19	0·77	0·19	0·70				1·85
4 „ 5 „						0·45	1·09	0·55	0·31				2·40
5 „ 6 „			0·01			0·83	0·78	0·79	0·56				2·97
6 „ 7 „						1·10	0·76	0·80	1·80				4·46
7 „ 8 „						0·47	1·15	0·60	0·05				2·27
8 „ 9 „						0·12	1·47	0·49	0·90				2·98
9 „ 10 „						0·77	1·16	0·90	0·49				3·32
10 „ 11 „						1·54	0·23	0·66	0·12				2·55
11 „ 12 „						0·18	0·77	0·54	0·27				1·76
12 „ 1 P.M.						0·19	1·20	0·35	0·05				1·79
1 „ 2 „						0·48	0·87	0·25	0·00				1·60
2 „ 3 „						0·41	0·87	0·22	0·08				1·58
3 „ 4 „						0·43	1·08	0·17	0·00				1·68
4 „ 5 „						0·13	0·93	0·29	0·00				1·35
5 „ 6 „						0·48	1·28	0·38	0·00				2·14
6 „ 7 „						0·51	0·15	0·30	0·18				1·14
7 „ 8 „						0·16	0·32	0·12	0·09				0·69
8 „ 9 „						0·16	0·78	0·08	0·13				1·15
9 „ 10 „						0·22	0·40	0·05	0·12				0·79
10 „ 11 „						0·28	0·69	0·06	0·02	0·14			1·19
11 to 12 „						0·51	0·34	0·78	0·00				1·63

The above table includes the Rainfall on week-days only.

Rainfall, 1868.

TABLE XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 46 feet above the ground, for each Day and each Month of the Year.*

1868.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
						in.	in.	in.	in.	in.		
1						0·03	0·25	0·47	0·33	0·14		
2						0·01	0·02	0·01				
3						0·01	0·95	0·34	0·01		0·01	
4						0·07	0·12	0·16	0·01			
5						0·05	0·01	0·51	0·07			
6								0·66	0·62			
7						2·33		0·03	0·06			
8						0·28		0·31	0·76			
9						2·03	0·52	9·28				
10						0·20		1·38	0·05			
11						1·90	0·20	0·06				
12						0·19	0·63	0·17				
13						0·01	1·79	0·20	0·02			
14						0·17	0·67	0·03				
15						0·48	1·58					
16						1·43	4·07	0·05	1·00			
17						0·13	0·71	0·02				
18						0·01	0·16	0·05				
19						0·18	0·32	0·01	0·02			
20						0·18	0·06		0·76			
21						0·02	0·30		0·05			
22						0·08	0·28		0·33			
23						0·14	0·79	0·08	0·29			
24						0·25	0·52	0·01	1·12			
25						0·04	0·10		1·20			
26						0·07	0·04	0·37	0·21			
27						0·24	0·10	0·28				
28						0·01	1·07	0·66				
29						0·16	1·46	0·11	0·44			
30						0·85	0·90	0·11				
31							0·40	2·78				
Monthly Total.						11·55	18·02	18·14	7·35	0·14	0·01	
No. of rainy days.						29	27	26	19	1	1	

Total fall of rain in the year	55·21 in.
Total number of rainy days in the year	103
The greatest fall of rain in one month (August)	18·14 in.

No rain fell in the months January to May, and December, nor on any of the days left blank in the above table.

Rainfall, 1868.

TABLE XXI.—*Total Fall of Rain, as measured by Osler's Gauge, placed* 46 *feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
						in.	in.	in.	in.	in.	in.		in.
12 to 1 A.M.						0·06	0·72	0·06	0·10				0·94
1 „ 2 „						0·18	1·01	0·53	0·18		0·01		1·91
2 „ 3 „						0·26	0·24	0·15	0·01				0·66
3 „ 4 „						0·16	0·65	0·13	0·64				1·58
4 „ 5 „						0·34	1·00	0·35	0·26				1·95
5 „ 6 „						0·77	0·63	0·80	0·48				2·68
6 „ 7 „						1·05	0·48	0·67	1·90				4·10
7 „ 8 „						0·43	1·09	0·49	0·02				2·03
8 „ 9 „						0·08	1·33	0·38	0·85				2·64
9 „ 10 „						0·67	1·18	0·78	0·58				3·21
10 „ 11 „						1·36	0·18	0·66	0·09				2·29
11 „ 12 „						0·17	0·63	0·46	0·28				1·54
12 to 1 P.M.						0·17	1·06	0·38	0·03				1·64
1 „ 2 „						0·41	0·77	0·23	0·01				1·42
2 „ 3 „						0·39	0·82	0·22	0·07				1·50
3 „ 4 „						0·38	0·94	0·11	0·01				1·44
4 „ 5 „						0·11	0·77	0·30					1·18
5 „ 6 „						0·43	1·18	0·33					1·94
6 „ 7 „						0·40	0·13	0·27	0·16				0·96
7 „ 8 „						0·22	0·27	0·08	0·08				0·65
8 „ 9 „						0·11	0·67	0·04	0·08				0·90
9 „ 10 „						0·22	0·38	0·05	0·11				0·76
10 „ 11 „						0·21	0·60	0·04	0·01	0·13			0·99
11 „ 12 „						0·44	0·29	0·76		0·01			1·50

The above Table includes the Rainfall on week-days only.

Mean Daily Velocities of the North and East Components of the Wind, 1868.

TABLE XXII.—*Showing the Mean Velocities of the North or South and East or West Components of the Winds which blew on each Day of the year* 1868.

In miles per hour.

1868. Date.	MONTH.																							
	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
1	4·1 N	1·0 W	7·4 N	1·6 W	14·1 N	9·4 W	8·6 N	4·5 W	5·0 N	7·9 W	2·5 N	9·6 W	8·0 S	22·1 W	7·1 S	15·4 W	16·7 S	4·9 W	4·9 N	3·2 W	8·3 N	1·0 E	3·9 N	2·4 E
2			9·6 N	4·1 W	19·1 N	8·0 W	10·5 N	6·7 W	6·9 N	7·6 W	2·3 N	6·1 W	8·5 S	13·2 W	1·3 S	13·3 W	5·0 S	9·1 W	5·4 N	0·7 W	4·3 N	5·5 E	5·4 N	2·8 E
3	4·1 N	2·0 W	5·1 N	1·1 W	16·2 N	7·7 W	12·7 N	9·4 W	6·3 N	6·3 W	2·4 N	5·0 W	9·8 S	0·2 E	1·6 S	13·9 W	2·0 N	11·7 W	6·1 N	2·4 W	7·9 N	0·9 E	6·6 N	3·8 E
4	12·3 N	3·9 W	4·9 N	3·1 W	12·1 N	6·5 W	12·8 N	6·2 W	3·9 S	4·5 W	2·1 N	0·6 E	8·6 S	6·3 W	5·7 S	20·3 W	3·2 N	13·8 W	9·1 N	5·6 W	1·4 N	0·7 E	11·3 N	5·2 E
5	15·6 N	5·7 W	3·9 N	4·7 W	15·2 N	6·2 W	13·6 N	8·1 W	1·9 S	4·3 W	8·6 N	2·2 W	3·6 S	11·4 W	7·9 S	20·2 W	1·1 S	16·4 W	9·2 N	6·6 W	5·9 N	0·3 W	9·1 N	5·2 E
6	13·3 N	3·3 W	5·2 N	0·4 W	13·8 N	5·6 W	10·9 N	6·6 W	4·1 S	7·4 W	0·8 N	0·1 W	2·7 S	9·5 W	2·7 N	19·0 W	0·0	14·1 W	8·8 N	6·3 W	6·2 N	0·1 E	7·3 N	3·0 E
7	9·2 N	4·3 W	11·3 N	0·6 W	12·2 N	5·1 W	1·9 N	5·1 W	3·6 S	7·8 W	4·2 S	4·8 E	2·0 N	6·3 W	2·5 N	18·2 W	2·3 S	12·0 W	3·9 N	2·9 W	6·8 N	0·3 E	7·2 N	1·7 E
8	6·9 N	2·6 W	9·1 N	1·9 W	8·6 N	5·0 W	7·0 S	5·1 W	0·4 S	8·0 W	18·3 S	15·6 E	3·1 N	6·7 W	7·7 S	23·9 W	0·9 S	5·4 W	2·2 N	2·6 W	6·1 N	0·3 E	4·4 N	1·8 E
9	7·4 N	0·7 W	5·8 N	3·9 W	1·1 N	3·0 W	2·8 S	5·7 W	...	...	30·4 S	8·1 E	1·8 N	9·1 W	13·5 S	36·8 W	6·2 N	6·0 W	7·3 N	2·4 W	4·7 N	0·9 E	2·1 N	2·3 E
10	5·3 N	2·5 W	7·0 N	5·9 W	7·0 N	4·2 W	3·8 S	5·7 W	1·8 S	6·4 W	25·3 S	5·3 W	1·5 S	12·1 W	10·0 S	34·0 W	9·5 N	9·1 W	6·3 N	2·7 W	5·9 N	0·2 W	6·0 N	0·6 E
11	8·9 N	1·4 W	7·3 N	5·5 W	6·8 N	6·2 W	3·1 N	5·6 W	2·7 S	8·3 W	19·2 S	1·7 W	4·8 S	14·7 W	12·5 S	30·1 W	6·0 N	12·4 W	3·7 N	1·4 W	4·0 N	0·1 W	8·7 N	0·0
12	11·2 N	3·4 W	7·9 N	5·7 W	7·4 N	5·5 W	6·9 N	6·9 W	1·7 S	7·3 W	8·9 S	12·5 W	13·2 S	8·3 W	12·2 S	24·0 W	3·5 N	8·5 W	5·8 N	1·3 E	1·9 N	0·4 E	9·1 N	2·4 W
13	8·9 N	0·3 W	6·1 N	4·4 W	8·7 N	8·6 W			1·3 S	6·9 W	9·2 S	13·2 W	9·8 S	7·5 W	8·7 S	21·1 W	2·6 N	8·2 W	4·6 N	1·7 E	1·6 N	0·2 W	4·7 N	1·1 W
14	4·7 N	0·5 E	5·8 N	4·2 W	4·8 N	7·4 W	4·9 N	9·6 W	2·6 S	6·8 W	12·9 S	12·9 W	8·8 S	19·3 W	8·5 S	18·9 W	2·0 N	9·3 W	6·0 N	0·7 W	6·0 N	0·2 E	2·8 N	1·6 E
15	1·6 N	0·1 W	6·6 N	5·1 W	8·4 N	8·2 W	8·3 N	7·9 W	0·5 N	6·2 W	17·8 S	14·1 W	6·7 S	22·1 W	8·1 S	19·6 W	2·3 N	10·0 W	4·8 N	1·4 E	8·8 N	0·2 E	2·3 N	0·7 E
16	5·9 N	0·3 E	1·9 N	1·8 W	6·2 N	5·1 W	13·1 N	7·6 W	1·1 N	8·2 W	8·0 S	21·5 W	2·3 S	20·0 W	7·6 S	20·1 W	0·2 S	9·3 W	0·7 N	2·7 E	8·6 N	0·6 E	3·3 N	0·5 E
17	7·5 N	1·5 W	0·2 S	0·0	2·7 S	4·2 W	13·8 N	8·7 W	2·5 S	6·9 W	9·9 S	24·0 W	7·4 S	20·3 W	12·6 S	15·3 W	1·4 N	7·5 W	2·9 N	1·5 E	8·1 N	3·4 E	6·7 N	0·2 W
18	10·4 N	3·4 W	3·6 N	1·1 W	2·9 S	2·1 W	13·5 N	8·9 W	8·3 S	7·2 W	8·5 S	22·5 W	6·4 S	19·8 W	8·4 S	17·1 W	3·1 N	6·7 W	3·9 N	1·9 E	6·5 N	0·2 W	12·8 N	2·8 W
19	10·9 N	2·7 W	8·2 N	4·5 W	3·7 S	2·2 W	8·9 N	9·9 W	4·8 S	7·7 W	9·9 S	24·1 W	8·0 S	17·1 W	6·4 S	15·4 W	1·2 N	5·1 W	2·2 S	1·7 E	5·5 N	1·0 E	6·1 N	0·5 W
20	2·3 N	2·2 W	10·6 N	6·9 W	5·8 N	4·7 W	4·0 S	6·7 W	8·2 S	7·0 W	10·2 S	22·8 W	8·8 S	14·2 W	1·9 S	15·1 W	1·4 N	6·3 W	4·0 N	0·2 W	6·5 N	0·4 E	6·4 N	0·7 W
21	9·5 N	6·5 W	10·1 N	6·3 W	9·6 N	7·4 W	2·0 S	6·7 W	6·2 S	6·3 W	4·6 S	22·0 W	8·3 S	6·8 W	0·9 S	14·8 W			1·8 S	0·3 W	6·9 N	0·4 E	5·3 N	0·1 W
22	12·7 N	4·0 W	12·5 N	7·6 W	10·2 N	6·4 W	1·1 S	7·8 W	0·4 S	6·0 W	2·0 S	20·0 W	5·2 S	11·8 W	0·1 N	16·3 W	4·7 S	3·8 W	0·2 N	0·7 E	5·9 N	0·2 E	6·7 N	2·2 W
23	16·7 N	6·1 W	10·5 N	7·4 W	12·3 N	6·2 W	7·2 N	5·3 W	5·8 N	8·8 W	7·4 S	19·2 W	8·7 S	12·7 W	2·1 S	12·0 W	3·8 S	3·9 W	1·8 N	0·4 E	3·5 N	2·4 E	5·6 N	0·5 W
24	8·9 N	3·5 W	8·7 N	6·4 W	8·1 N	5·6 W	10·6 N	8·4 W	5·7 N	9·1 W	5·1 S	17·2 W	6·8 S	17·5 W	4·5 S	11·3 W	3·4 S	2·8 W	7·5 N	1·5 W	5·0 N	2·9 E	4·7 N	0·8 E
25	0·2 N	0·6 W	11·9 N	3·8 W	4·1 N	5·7 W	10·3 N	6·1 W	2·4 N	7·6 W	3·0 S	14·0 W	0·0	16·2 W	5·1 S	10·4 W	2·6 N	3·1 W	7·0 N	0·8 W	1·7 N	2·6 E	1·1 S	2·3 E
26	4·5 N	1·4 W	9·2 N	3·2 W	3·8 N	4·9 W	5·1 N	8·9 W	3·2 N	7·4 W	8·3 S	9·3 W	2·2 N	16·9 W	6·1 S	10·3 W	5·9 N	3·6 W	3·6 N	2·2 W	6·5 N	1·7 E	4·3 N	0·1 W
27	10·2 N	3·8 W	1·5 S	0·4 E	3·0 S	6·3 W	3·9 S	7·5 W	6·0 N	9·3 W	8·3 S	15·3 W	5·0 S	22·7 W	7·2 S	8·0 W	7·6 N	2·1 W	2·3 N	2·0 W	4·5 N	2·0 E		
28	10·2 N	5·1 W	5·2 N	0·7 W	0·8 N	4·2 W	7·6 N	11·4 W	4·2 N	9·3 W	9·3 S	24·6 W	0·0	31·3 W	2·6 S	11·9 W	4·9 N	1·7 W	1·6 N	5·3 E	4·7 N	3·5 E	9·6 N	0·9 W
29	0·9 N	5·7 W	6·5 N	1·9 W	4·5 N	6·0 W	5·9 N	9·0 W	4·9 N	9·9 W	9·3 S	25·2 W	2·0 N	28·2 W	0·3 N	11·3 W	3·5 S	2·7 E	4·5 N	0·3 E	6·7 N	0·5 E	13·6 N	2·6 W
30	4·9 N	5·8 W			9·1 N	5·2 W	1·2 N	7·3 W	5·7 N	10·7 W	7·9 S	23·4 W	4·5 S	25·7 W	2·9 N	5·1 W	2·2 N	0·4 E	5·2 N	0·3 W	5·7 N	2·2 E	13·0 N	3·2 W
31	12·7 N	0·1 W			9·4 N	7·7 W			3·5 N	10·1 W			12·0 S	16·2 W	0·9 S	8·5 W			6·0 N	2·0 E			10·4 N	4·1 W
Monthly Mean. ...	8·0 N	2·7 W	6·9 N	3·6 W	7·3 N	5·8 W	5·7 N	7·3 W	0·2 N	7·6 W	8·0 S	12·0 W	5·0 S	15·0 W	5·2 S	17·1 W	0·8 N	7·0 W	4·4 N	0·8 W	5·5 N	1·1 E	6·6 N	0·5 E
Annual Variation....	5·7 N	3·7 E	4·6 N	2·8 E	5·0 N	0·6 E	3·4 N	0·9 W	2·1 S	1·2 W	10·3 S	5·6 W	7·3 S	8·6 W	7·5 S	10·7 W	1·5 S	0·6 W	2·1 N	5·6 E	3·2 N	7·5 E	4·3 N	6·9 E

The Velocities of the mean Components for the year are 2·3 N. and 6·4 W.

Diurnal Variation of the Velocity of the North and East Components of the Wind, 1868.

TABLE XXIII.—*Showing the Excess of the Mean Velocities of the North or South and East or West Components of the Winds which blew at each Hour of the Day, above the respective Means for the whole Day, in each month of the year* 1868.

In miles per hour.

1868. Bombay Civil Time.	MONTH.																									
	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Year.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
12 to 1 A.M.	1·7 S	2·9 E	0·5 S	1·2 E	1·7 S	1·6 E	0·3 N	2·8 E	0·2 S	2·3 E	1·1 S	4·3 E	0·2 S	2·1 E	1·6 S	1·5 E	0·9 S	0·2 E	1·4 S	2·1 E	2·8 S	3·3 E	2·7 S	2·8 E	1·2 S	2·3 E
1 ,, 2 ,,	1·7 S	2·9 E	1·5 S	3·0 E	1·4 S	1·6 E	0·3 N	3·5 E	0·4 S	3·5 E	1·1 S	2·8 E	1·9 S	1·5 E	1·8 S	0·9 E	0·4 S	0·3 E	2·2 S	3·3 E	2·3 S	3·8 E	2·8 S	3·9 E	1·4 S	2·6 E
2 ,, 3 ,,	1·4 S	2·9 E	1·7 S	3·8 E	1·4 S	3·0 E	1·4 S	5·1 E	0·5 S	4·7 E	1·9 S	2·4 E	1·1 S	0·4 E	1·0 S	1·3 E	1·1 S	0·8 E	2·5 S	4·3 E	1·9 S	5·1 E	2·3 S	4·4 E	1·5 S	3·2 E
3 ,, 4 ,,	0·5 S	3·2 E	1·0 S	4·2 E	1·0 S	4·8 E	1·1 S	5·6 E	1·0 S	4·0 E	0·6 S	2·3 E	1·0 S	0·5 E	0·9 S	0·5 E	1·6 S	0·7 E	1·9 S	4·7 E	0·6 S	5·2 E	1·2 S	4·8 E	1·0 S	3·4 E
4 ,, 5 ,,	0·5 S	3·5 E	1·3 S	4·7 E	1·0 S	5·4 E	1·4 S	6·6 E	1·0 S	5·2 E	0·6 N	3·1 E	0·2 N	1·0 W	0·6 N	0·5 W	1·2 S	2·3 E	1·6 S	4·7 E	1·2 S	5·7 E	1·4 S	5·2 E	0·8 S	3·7 E
5 ,, 6 ,,	0·7 S	4·0 E	1·2 S	5·1 E	1·0 S	6·2 E	2·3 S	6·8 E	1·6 S	5·2 E	0·5 N	1·6 E	1·6 N	0·5 W	0·0	0·6 W	1·6 S	3·3 E	1·9 S	6·0 E	0·2 N	7·0 E	0·7 S	5·7 E	0·7 S	4·1 E
6 ,, 7 ,,	1·8 S	5·0 E	1·9 S	6·1 E	2·5 S	7·8 E	2·9 S	7·5 E	1·4 S	5·3 E	1·0 N	2·4 E	0·0	0·2 E	0·6 N	0·3 W	1·5 S	2·8 E	2·3 S	6·2 E	0·6 N	6·9 E	0·5 S	6·0 E	1·0 S	4·7 E
7 ,, 8 ,,	2·9 S	6·0 E	1·4 S	7·4 E	1·8 S	8·3 E	3·9 S	8·4 E	2·1 S	6·4 E	0·4 N	2·5 E	0·2 S	1·0 E	0·6 N	1·1 W	2·8 S	5·3 E	3·4 S	7·0 E	0·3 S	8·1 E	0·9 S	6·4 E	1·6 S	5·5 E
8 ,, 9 ,,	2·7 S	6·1 E	1·5 S	8·4 E	1·1 S	7·7 E	4·1 S	8·1 E	2·3 S	5·0 E	0·0	1·0 E	0·6 N	0·7 E	1·3 N	0·1 W	2·6 S	4·9 E	3·0 S	6·7 E	1·2 S	7·4 E	1·4 S	7·0 E	1·5 S	5·2 E
9 ,, 10 ,,	2·4 S	6·2 E	2·4 S	8·4 E	0·6 S	5·9 E	4·0 S	4·3 E	1·6 S	3·6 E	0·3 S	0·2 E	0·6 S	0·3 E	1·9 N	0·9 W	1·1 S	1·4 E	2·5 S	5·7 E	2·0 S	5·9 E	2·2 S	6·4 E	1·5 S	3·9 E
10 ,, 11 ,,	3·1 S	3·8 E	1·1 S	4·7 E	0·7 S	3·5 E	3·0 S	0·2 W	1·1 S	0·6 W	0·7 S	0·5 E	0·5 S	0·5 W	0·2 S	0·8 W	0·5 S	0·8 E	2·6 S	2·4 E	2·8 S	4·2 E	2·8 S	4·4 E	1·6 S	1·8 E
11 ,, 12 ,,	2·1 S	1·2 E	0·7 S	0·6 E	0·2 S	2·8 W	1·2 S	3·8 W	1·2 S	3·0 W	1·6 N	1·9 W	0·6 N	2·1 W	1·1 N	1·3 W	0·4 S	2·0 W	2·3 S	0·7 W	2·4 S	0·7 E	2·5 S	0·7 E	0·8 S	1·2 W
12 to 1 P.M.	1·0 S	3·9 W	0·4 N	5·5 W	0·2 N	7·1 W	0·7 N	7·5 W	0·1 N	6·0 W	0·5 N	2·6 W	0·9 N	1·5 W	0·1 N	1·5 W	0·5 N	2·9 W	0·7 S	4·8 W	1·9 S	4·0 W	1·5 S	3·5 W	0·1 S	4·2 W
1 ,, 2 ,,	0·3 N	6·8 W	0·8 N	7·4 W	1·3 N	8·1 W	2·4 N	8·4 W	0·8 N	6·4 W	1·3 N	4·1 W	1·2 N	1·5 W	0·4 N	1·3 W	1·5 N	4·0 W	0·7 N	7·2 W	1·1 S	7·0 W	0·7 S	6·8 W	0·7 N	5·7 W
2 ,, 3 ,,	1·9 N	8·5 W	1·0 N	8·7 W	2·7 N	9·1 W	3·5 N	8·6 W	1·2 N	8·0 W	0·2 N	4·1 W	1·0 N	2·5 W	0·7 S	1·4 W	2·9 N	4·2 W	1·8 N	8·9 W	0·0	9·6 W	1·2 N	8·4 W	1·4 N	6·8 W
3 ,, 4 ,,	2·9 N	8·9 W	1·9 N	9·0 W	3·5 N	10·3 W	3·8 N	8·3 W	2·1 N	8·3 W	0·3 N	4·4 W	1·2 N	2·1 W	0·4 S	1·3 W	3·6 N	4·6 W	3·4 N	8·7 W	1·1 N	10·8 W	2·5 N	9·7 W	2·2 N	7·2 W
4 ,, 5 ,,	4·1 N	7·8 W	2·4 N	8·0 W	4·0 N	8·3 W	4·4 N	8·0 W	2·0 N	7·0 W	1·2 N	3·4 W	1·1 N	2·3 W	0·8 S	2·3 W	3·8 N	4·9 W	4·5 N	8·9 W	2·6 N	11·0 W	3·5 N	9·1 W	2·7 N	6·7 W
5 ,, 6 ,,	4·2 N	6·8 W	2·9 N	7·6 W	3·8 N	6·7 W	3·6 N	7·5 W	2·4 N	5·5 W	0·3 N	2·7 W	0·0	1·8 W	0·0	0·3 W	3·1 N	3·9 W	4·4 N	6·8 W	4·3 N	8·5 W	4·1 N	7·5 W	2·8 N	5·5 W
6 ,, 7 ,,	4·6 N	5·3 W	3·1 N	5·7 W	3·0 N	5·1 W	3·1 N	5·6 W	2·1 N	3·3 W	1·4 N	1·4 W	0·5 N	0·3 E	0·2 N	1·3 E	2·4 N	2·0 W	4·4 N	4·7 W	5·2 N	6·6 W	4·7 N	6·2 W	2·9 N	3·7 W
7 ,, 8 ,,	4·4 N	4·3 W	2·9 N	4·0 W	2·2 N	3·4 W	0·7 N	1·9 W	1·8 N	0·3 W	0·3 S	0·9 W	0·6 S	1·0 E	1·0 N	1·2 E	1·0 N	0·3 E	3·9 N	3·4 W	5·3 N	5·4 W	5·0 N	5·9 W	2·3 N	2·2 W
8 ,, 9 ,,	2·0 N	1·5 W	1·5 N	2·3 W	0·3 N	0·6 W	1·1 N	0·8 W	1·3 N	0·2 E	1·2 S	1·0 E	1·5 S	1·5 E	0·5 N	0·8 E	0·1 N	1·0 E	2·3 N	1·5 W	3·0 N	2·6 W	3·5 N	3·6 W	1·1 N	0·7 W
9 ,, 10 ,,	0·6 N	0·4 E	0·7 N	0·6 W	1·9 S	1·2 E	1·5 N	0·7 W	0·6 N	0·8 E	1·2 S	0·1 E	0·2 N	1·1 E	0·1 N	1·4 E	0·4 S	1·9 E	1·8 N	0·1 W	1·1 N	0·8 W	0·9 N	1·0 W	0·3 N	0·3 E
10 ,, 11 ,,	0·7 S	2·0 E	0·5 S	0·7 E	2·2 S	1·7 E	0·8 N	0·2 E	0·5 N	1·2 E	0·2 N	1·0 E	0·7 S	1·9 E	0·8 S	1·7 E	1·2 S	1·8 E	1·3 N	1·3 E	0·1 S	0·9 E	0·2 S	0·6 E	0·3 S	1·2 E
11 ,, 12 ,,	1·7 S	2·6 E	0·8 S	1·3 E	1·7 S	1·7 E	0·4 S	1·2 E	0·2 N	1·9 E	0·9 S	1·4 E	0·0	2·3 E	1·4 S	1·9 E	0·8 S	0·9 E	1·2 S	1·8 E	2·3 S	2·3 E	1·8 S	2·2 E	1·1 S	1·8 E

Velocity of Wind, 1868.

TABLE XXIV.—*Mean Velocity of the Wind, in miles per hour, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Monthly Mean Velocity and its Variation from the Mean of the Year.*

1868.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1	6·5	9·4	17·7	11·2	10·7	10·3	23·7	17·4	19·5	8·5	11·6	7·7
2	...	11·6	21·3	14·4	12·4	11·2	16·2	13·5	11·1	9·8	10·4	10·1
3	6·3	10·4	18·8	16·7	12·3	10·0	11·8	14·2	12·2	8·6	11·2	9·8
4	13·6	9·2	14·8	15·2	8·5	9·2	13·9	21·4	14·5	11·1	6·5	15·1
5	17·3	8·5	18·0	17·6	7·8	12·0	12·1	21·8	16·6	11·7	9·6	12·6
6	14·0	9·8	17·2	13·4	9·8	9·4	10·0	20·2	15·2	11·6	9·3	11·7
7	11·2	13·7	14·2	7·9	9·6	12·2	8·2	19·0	12·6	8·4	9·7	9·2
8	10·3	11·5	11·0	11·5	8·7	24·9	8·7	25·4	8·4	7·1	10·3	9·4
9	9·5	9·7	7·6	8·9	...	33·8	9·6	39·5	10·0	9·7	9·3	7·0
10	7·0	10·1	11·0	9·1	7·1	27·9	12·4	36·0	13·5	8·0	8·5	9·6
11	10·9	9·6	9·9	10·5	9·0	22·8	16·1	32·6	13·9	6·3	6·8	10·7
12	12·0	10·9	10·5	10·7	7·7	16·5	20·0	27·2	9·2	8·5	6·7	10·3
13	10·6	8·8	12·7	...	7·2	16·4	17·8	23·0	9·2	8·0	6·8	7·3
14	8·6	8·5	9·3	11·1	8·6	19·1	24·8	20·8	9·7	7·9	7·8	7·5
15	8·0	8·7	12·4	12·3	8·7	24·1	23·8	21·2	10·8	7·2	11·5	5·8
16	8·3	7·6	10·9	16·5	9·4	25·6	21·2	21·7	9·6	5·6	10·7	6·5
17	9·5	7·6	10·0	17·2	9·3	26·0	22·6	20·4	7·8	7·2	10·7	9·1
18	12·7	8·6	9·2	16·9	16·2	24·2	21·1	19·9	7·7	8·6	9·8	13·6
19	12·7	10·4	7·7	14·3	9·5	26·0	19·1	16·7	10·0	7·5	8·4	8·8
20	8·2	13·1	11·0	11·2	11·2	25·1	17·2	15·5	9·9	7·1	9·2	8·9
21	11·9	13·0	12·9	8·2	9·6	23·0	12·7	15·0	...	7·7	8·4	7·8
22	13·7	15·2	13·0	9·3	7·5	20·4	13·4	16·4	8·1	6·0	7·7	8·5
23	18·8	13·9	14·6	11·2	11·5	21·0	16·7	12·5	9·2	10·5	8·3	7·9
24	10·1	11·4	10·8	15·2	11·3	18·3	19·1	12·2	8·4	9·4	8·8	7·9
25	8·4	13·5	7·2	14·3	8·7	14·6	16·2	11·7	7·2	8·8	7·3	6·5
26	7·7	11·6	9·1	13·0	9·8	15·0	17·3	13·7	9·2	6·7	10·6	10·7
27	11·8	7·3	7·5	15·5	11·4	18·0	22·8	11·8.	11·6	6·1	8·4	...
28	12·4	8·5	10·0	14·0	11·0	26·4	31·3	12·7	8·6	10·3	10·7	11·2
29	7·6	10·0	8·8	11·4	11·1	27·2	28·6	11·7	10·7	8·7	9·2	14·5
30	10·2		11·9	9·4	12·5	25·0	26·6	6·7	6·7	7·7	9·3	13·7
31	14·2		12·9		10·8		21·0	11·3		10·3		11·7
Monthly Mean.	10·8	10·4	12·1	12·7	10·0	19·9	17·9	18·8	10·7	8·4	9·1	9·7
Annual Variation.	− 1·7	− 2·1	− 0·4	+ 0·2	− 2·5	+ 7·4	+ 5·4	+ 6·3	− 1·8	− 4·1	− 3·4	− 2·8

	Miles.
The Mean Velocity for June to August	18·9
The Mean Velocity for September to May	10·4
The Mean Velocity for the Year	12·5
The greatest monthly mean (that of June)	19·9
The least monthly mean (that of October)	8·4
Difference	11·5

Velocity of Wind, 1868.

TABLE XXV.—*The Mean Diurnal Variation of the Velocity of the Wind, in miles per hour, for each Month and for the whole Year; or the Excess of the Mean Hourly Velocity above the respective Monthly and Annual Means.*

1868. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
12 to 1 A.M.	− 3·5	− 2·5	− 3·1	− 1·5	− 2·4	+ 0·8	− 1·0	0·0	− 1·2	− 1·4	− 3·2	− 3·0	− 1·8
1 „ 2 „	− 3·2	− 3·1	− 2·8	− 2·0	− 3·0	− 0·4	+ 0·6	0·0	− 1·7	− 0·9	− 2·5	− 2·1	− 1·8
2 „ 3 „	− 2·8	− 3·3	− 3·5	− 4·5	− 3·6	− 0·4	+ 0·5	− 0·8	− 1·9	− 1·6	− 0·9	− 2·0	− 2·1
3 „ 4 „	− 2·0	− 3·0	− 3·0	− 4·6	− 3·3	− 0·3	+ 1·1	+ 0·2	− 1·3	− 0·9	− 0·4	− 1·0	− 1·5
4 „ 5 „	− 2·0	− 3·0	− 3·1	− 5·0	− 3·3	− 0·7	+ 0·7	− 0·3	− 1·4	− 1·6	− 0·5	− 0·8	− 1·7
5 „ 6 „	− 2·3	− 3·2	− 3·6	− 5·1	− 3·9	− 0·6	− 0·4	+ 0·4	− 1·1	− 0·9	+ 1·4	− 0·2	− 1·6
6 „ 7 „	− 2·7	− 3·3	− 4·0	− 5·9	− 4·5	− 2·9	− 0·5	− 0·3	− 2·0	− 1·1	+ 1·5	− 0·1	− 2·1
7 „ 8 „	− 2·6	− 2·4	− 3·1	− 4·4	− 2·9	− 2·3	− 0·4	+ 0·7	− 0·5	− 0·9	+ 1·9	− 0·1	− 1·4
8 „ 9 „	− 2·7	− 1·8	− 3·1	− 4·0	− 2·7	− 0·9	− 0·5	− 0·4	− 1·1	− 1·1	+ 1·1	+ 0·1	− 1·4
9 „ 10 „	− 2·1	− 2·6	− 2·4	− 3·7	− 1·7	− 0·6	− 0·2	+ 0·2	− 0·8	− 1·3	− 0·6	− 0·9	− 1·4
10 „ 11 „	− 3·2	− 1·8	− 1·7	− 1·3	+ 0·2	− 0·8	+ 0·5	+ 0·5	− 0·5	− 2·1	− 2·4	− 2·7	− 1·3
11 „ 12 „	− 2·1	− 0·6	+ 1·0	+ 1·2	+ 2·2	− 1·5	+ 1·2	+ 0·7	+ 1·4	− 2·3	− 3·8	− 3·0	− 0·5
12 „ 1 P.M.	+ 1·4	+ 2·2	+ 4·1	+ 4·6	+ 4·9	+ 0·4	+ 0·4	+ 1·0	+ 1·3	− 0·2	− 1·8	− 1·8	+ 1·4
1 „ 2 „	+ 3·5	+ 3·7	+ 5·3	+ 5·9	+ 5·2	+ 1·3	+ 0·5	+ 0·7	+ 2·3	+ 1·9	+ 0·2	+ 0·6	+ 2·6
2 „ 3 „	+ 5·8	+ 5·8	+ 7·0	+ 6·5	+ 6·6	+ 2·2	+ 1·0	+ 1·1	+ 3·1	+ 3·6	+ 2·1	+ 3·0	+ 4·0
3 „ 4 „	+ 6·6	+ 6·5	+ 8·4	+ 6·9	+ 7·2	+ 3·0	+ 0·7	+ 0·9	+ 3·4	+ 4·3	+ 3·2	+ 4·1	+ 4·6
4 „ 5 „	+ 6·6	+ 6·0	+ 7·2	+ 6·5	+ 6·0	+ 0·4	+ 1·2	+ 1·8	+ 3·5	+ 5·2	+ 4·2	+ 4·4	+ 4·4
5 „ 6 „	+ 5·8	+ 5·4	+ 5·6	+ 5·7	+ 4·2	+ 1·1	+ 1·0	− 0·2	+ 1·9	+ 3·8	+ 3·7	+ 3·8	+ 3·5
6 „ 7 „	+ 4·9	+ 4·0	+ 3·8	+ 4·2	+ 1·9	+ 1·5	− 1·0	− 1·6	+ 0·8	+ 2·3	+ 3·1	+ 3·5	+ 2·3
7 „ 8 „	+ 4·1	+ 2·5	+ 1·8	+ 1·1	− 0·7	+ 0·9	− 0·6	− 1·2	− 0·3	+ 1·2	+ 2·8	+ 3·5	+ 1·3
8 „ 9 „	+ 0·7	+ 0·5	− 1·3	+ 0·1	− 1·5	− 0·3	− 0·1	− 0·8	− 0·1	− 0·9	− 0·1	+ 1·4	− 0·2
9 „ 10 „	− 1·1	− 0·7	− 3·0	+ 0·2	− 1·1	− 0·2	− 1·0	− 1·0	− 0·3	− 1·5	− 2·2	− 1·6	− 1·1
10 „ 11 „	− 2·8	− 2·1	− 3·5	0·0	− 1·7	− 0·2	− 1·4	− 0·8	− 1·3	− 1·4	− 2·7	− 2·5	− 1·7
11 „ 12 „	− 3·9	− 2·7	− 3·5	− 1·0	− 2·6	− 0·5	− 1·5	− 0·9	− 1·6	− 1·7	− 3·4	− 2·6	− 2·2

	Miles.
The Mean Velocity of the Wind for the hours from 10 P.M. to 10 A.M..	10·8
The Mean Velocity of the Wind for the hours from 10 A.M. to 10 P.M.	14·2
The Mean Velocity for 24 hours	12·5

In the Mean Diurnal Variation for the year a Maximum occurs about 4 P.M., and a Minimum at 11½ P.M.

Aggregate and Mean Velocities and Relative Frequency of Different Winds, 1868.

Table XXVI.—*Showing, for the year* 1868, *the Sums of the Velocities, and the Mean Velocities, in miles per hour, of the Winds which blew in each Month, from each of the Sixteen Principal Directions: also the number of Observations which those sums comprise; the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.*

1868.	N.			NNE.			NE.			ENE.			E.			ESE.			SE.			SSE.		
Month.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.	Sums of Veloci-ties.	Number of Obser-vations.	Mean Velo-city.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January......	1681	189	8·9	198	30	6·6	623	76	8·2	95	16	5·9	113	19	5·9	123	17	7·2	11	2	5·5	5	1	5·0
February ...	571	83	6·9	312	40	7·8	600	71	8·5	101	16	6·3	162	31	5·2	153	21	7·3	13	3	4·3			
March	804	84	9·6	293	33	8·9	227	23	9·9	32	4	8·0	17	3	5·7	144	16	9·0	114	19	6·0	64	11	5·8
April	453	63	7·2	273	37	7·4	114	14	8·1							42	7	6·0	23	5	4·6	43	3	14·3
May	109	19	5·7	56	8	7·0	18	2	9·0				20	4	5·0	23	3	7·7	24	6	4·0	94	7	13·4
June	23	3	7·7	52	7	7·4	143	13	11·0	65	10	6·5	8	1	8·0	347	22	15·8	551	28	19·7	919	32	28·7
July													34	6	5·7				29	4	7·2	494	29	17·0
August	34	5	6·8										22	4	5·5				11	2	5·5			
September ...	122	19	6·4	84	12	7·0	24	7	3·4	45	7	6·4	50	9	5·6	203	22	9·2	148	14	10·6	260	21	12·4
October	434	74	5·9	284	45	6·3	597	73	8·2	417	63	6·6	298	49	6·1	451	50	9·0	131	15	8·7	86	8	10·7
November ...	460	66	7·0	209	31	6·7	1595	170	9·4	842	101	8·3	342	48	7·1	244	39	6·3						
December ...	915	116	7·9	298	52	5·7	1311	131	10·0	677	81	8·4	343	50	6·9	131	19	6·9	30	5	6·0	4	1	4·0
Year......	5606	721	7·8	2059	295	7·0	5252	580	9·1	2274	298	7·6	1409	224	6·3	1861	216	8·6	1085	103	10·5	1969	113	17·4

[*Continued.*

1868	S.			SSW.			SW.			WSW.			W.			WNW.			NW.			NNW.		
Month.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January ……	9	2	4·5				22	3	7·3	218	21	10·4	215	23	9·3	224	24	9·3	1822	131	13·9	2371	164	14·5
February …				50	3	16·7	28	5	5·6	115	10	11·5	160	20	8·0	510	43	11·9	3005	211	14·2	1427	136	10·5
March ……	26	3	8·7	38	6	6·3	86	16	5·4	327	28	11·7	270	34	7·9	1078	73	14·8	3633	256	14·2	1803	130	13·9
April ………	432	29	14·9	231	24	9·6	72	9	8·0	301	30	10·0	604	54	11·2	1789	129	13·9	3160	187	16·9	1231	93	13·2
May ………	266	21	12·7	454	50	9·1	523	73	7·2	1005	100	10·0	1493	163	9·2	2159	178	12·1	834	80	10·4	149	16	9·3
June ………	669	25	26·8	855	39	21·9	1272	74	17·2	6744	308	21·9	1743	95	18·3	482	32	15·1	193	20	9·6	79	9	8·8
July ………	205	11	18·6	453	28	16·2	1137	75	15·2	5473	295	18·6	4656	228	20·4	819	64	12·8				4	1	4·0
August ……	56	5	11·2	126	8	15·7	873	52	16·8	8902	419	21·2	3307	201	16·5	535	38	14·1	57	5	11·4	22	5	4·4
September …	148	12	12·3	191	13	14·7	337	33	10·2	699	64	10·9	2065	192	10·8	1762	166	10·6	1155	89	13·0	126	15	8·4
October ……	43	6	7·2	4	1	4·0	14	3	4·7	27	5	5·4	99	14	7·1	698	80	8·7	1522	128	11·9	1067	117	9·1
November …							5	1	5·0				109	15	7·3	632	61	10·4	990	84	11·8	1013	84	12·1
December …							15	3	5·0	33	5	6·6	113	16	7·1	401	49	8·2	885	82	10·8	1799	112	16·1
Year……	1854	114	16·3	2402	172	14·0	4384	347	12·6	23844	1285	18·6	14834	1055	14·1	11089	937	11·8	17256	1273	13·6	11091	882	12·6

Barometric Pressure, 1869.

TABLE I.—*Mean Height of Standard Barometer (No. 58), Corrected for Temperature, for each Day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1869.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·960	29·915	29·917	29·824	29·674	29·718	...	29·663	29·803	29·888	29·833
2	29·972	·929	·879	·892	...	·635	·733	29·693	·637	·778	·918	·812
3	...	·925	·877	·848	·844	·578	·707	·724	·647	...	...	·838
4	30·002	·957	·910	...	·819	·527	...	·751	·689	·767	·905	·858
5	29·975	·954	·898	·868	·832	·569	·669	·714	...	·740	·905	...
6	·989	·931	·905	·831	·835	...	·693	·681	·772	·774	·897	·895
7	·999	...	...	·807	·833	·668	·684	·658	·775	·797	...	·918
8	·987	·899	·874	·776	·836	·655	·678	...	·812	·775	·924	·935
9	·984	...	·888	·754	...	·679	·713	·757	·779	·778	·955	·929
10	...	·942	·868	·755	·830	·708	·734	·727	·745	...	·942	·892
11	·998	·950	·841	...	·812	·747	...	·672	·693	·780	·939	·882
12	·998	·934	·853	·862	·801	·775	·632	·644	...	·788	·964	...
13	30·016	·922	·875	·838	·793	...	·645	·693	·740	·807	·920	·860
14	·014	...	...	·818	·791	·759	·657	·773	·788	·819	...	·862
15	·046	·965	·873	·820	·771	·799	·619	...	·755	·843	·890	·884
16	·025	·938	·908	·842	...	·824	·558	·757	·711	·855	·905	·890
17	...	·932	·901	·821	·757	·789	·526	·740	·700	...	·904	·934
18	29·957	·975	·857	...	·772	·714	...	·682	·702	·879	·895	·935
19	·945	·972	·829	·786	·744	·694	·503	·632	...	·915	·883	...
20	·959	·947	·837	·812	·766	...	·570	·617	·580	·895	·918	·947
21	·954	...	...	·831	·784	·679	·636	...	·619	·834	...	·952
22	·912	·939	·838	·803	·722	·644	·687	...	·719	·823	·913	·916
23	·864	·900	·853	·788	...	·611	·662	·691	·760	·871	·914	·904
24	...	·886	·914	·799	...	·515	·640	·670	·740	...	·970	·946
25	·907	...	·911	...	·695	·512	...	·722	·729	·856	·924	...
26	·918	·911	...	·802	·692	·549	·715	·729	...	·842	·886	...
27	·919	·927	·890	·819	·700	...	·737	·741	·778	·866	·846	·957
28	·942	...	...	·824	·680	·587	·750	·762	·811	·869	...	·960
29	·933		·883	·827	·694	·595	·731	...	·816	·851	·859	·938
30	·936		·874	·812	...	·649	·715	[illegible]	·812	·829	·846	·924
31	...		·902		·690		·713	·702		...		·894
Monthly Mean.	29·966	29·936	29·879	29·821	29·773	29·659	29·668	29·705	29·730	29·824	29·908	29·904
Annual Variation.	+0·152	+0·122	+0·065	+0·007	−0·041	−0·155	−0·146	−0·109	−0·084	+0·010	+0·094	+0·090

	in.
Mean of the months from January to March and October to December	29·903
Mean of the months from April to September	29·726
Mean for the Year	29·814
The greatest monthly mean (that of January)	29·966
The least monthly mean (that of June)	29·659
Difference..........	0·307

Barometric Pressure, 1869.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year; or the Excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·004	+0·008	+0·005	+0·008	+0·005	+0·007	+0·005	+0·008	+0·005	+0·004	+0·005	+0·001	+0·005
1 A.M.	− ·006	− ·005	− ·010	− ·004	− ·008	− ·010	− ·011	− ·006	− ·009	− ·010	− ·008	− ·010	− ·008
2 ,,	− ·019	− ·020	− ·023	− ·016	− ·020	− ·023	− ·023	− ·019	− ·024	− ·024	− ·019	− ·021	− ·021
3 ,,	− ·030	− ·028	− ·030	− ·023	− ·027	− ·027	− ·030	− ·026	− ·033	− ·031	− ·025	− ·031	− ·028
4 ,,	− ·028	− ·028	− ·029	− ·020	− ·022	− ·025	− ·029	− ·024	− ·029	− ·025	− ·021	− ·027	− ·026
5 ,,	− ·017	− ·018	− ·018	− ·009	− ·010	− ·018	− ·022	− ·019	− ·018	− ·014	− ·010	− ·018	− ·016
6 ,,	− ·002	+ ·001	+ ·005	+ ·010	+ ·011	·000	+ ·006	− ·005	− ·004	+ ·007	+ ·011	− ·002	+ ·003
7 ,,	+ ·024	+ ·024	+ ·026	+ ·032	+ ·032	+ ·017	+ ·009	+ ·013	+ ·016	+ ·031	+ ·033	+ ·024	+ ·023
8 ,,	+ ·053	+ ·047	+ ·046	+ ·053	+ ·046	+ ·030	+ ·024	+ ·031	+ ·035	+ ·051	+ ·053	+ ·048	+ ·043
9 ,,	+ ·073	+ ·068	+ ·061	+ ·064	+ ·053	+ ·036	+ ·034	+ ·042	+ ·044	+ ·065	+ ·067	+ ·064	+ ·056
10 ,,	+ ·073	+ ·071	+ ·064	+ ·057	+ ·050	+ ·039	+ ·036	+ ·044	+ ·048	+ ·059	+ ·058	+ ·062	+ ·055
11 ,,	+ ·052	+ ·051	+ ·051	+ ·044	+ ·042	+ ·030	+ ·030	+ ·039	+ ·040	+ ·039	+ ·036	+ ·041	+ ·041
Noon.	+ ·019	+ ·023	+ ·026	+ ·025	+ ·027	+ ·020	+ ·020	+ ·025	+ ·017	+ ·012	+ ·005	+ ·010	+ ·019
1 P.M.	− ·015	− ·009	− ·002	− ·004	+ ·004	+ ·004	+ ·007	+ ·002	− ·006	− ·016	− ·024	− ·020	− ·007
2 ,,	− ·039	− ·036	− ·025	− ·029	− ·019	− ·013	− ·008	− ·019	− ·027	− ·037	− ·044	− ·042	− ·028
3 ,,	− ·052	− ·052	− ·045	− ·047	− ·038	− ·029	− ·023	− ·037	− ·042	− ·051	− ·054	− ·052	− ·043
4 ,,	− ·053	− ·055	− ·051	− ·057	− ·048	− ·037	− ·034	− ·044	− ·044	− ·050	− ·054	− ·052	− ·048
5 ,,	− ·047	− ·048	− ·045	− ·052	− ·048	− ·034	− ·033	− ·039	− ·038	− ·039	− ·043	− ·041	− ·042
6 ,,	− ·034	− ·035	− ·035	− ·041	− ·037	− ·026	− ·022	− ·025	− ·023	− ·026	− ·026	− ·026	− ·030
7 ,,	− ·012	− ·016	− ·020	− ·023	− ·025	− ·012	− ·008	− ·010	− ·006	− ·007	− ·004	− ·004	− ·012
8 ,,	+ ·007	+ ·005	·000	− ·006	− ·008	+ ·004	+ ·007	+ ·008	+ ·013	+ ·013	+ ·014	+ ·016	+ ·006
9 ,,	+ ·017	+ ·018	+ ·015	+ ·009	+ ·006	+ ·017	+ ·020	+ ·021	+ ·028	+ ·023	+ ·023	+ ·029	+ ·019
10 ,,	+ ·019	+ ·022	+ ·019	+ ·018	+ ·014	+ ·026	+ ·027	+ ·027	+ ·029	+ ·022	+ ·024	+ ·027	+ ·023
11 ,,	+ ·013	+ ·014	+ ·015	+ ·014	+ ·012	+ ·023	+ ·022	+ ·019	+ ·022	+ ·013	+ ·013	+ ·015	+ ·016

In the Mean Diurnal Variation for the year—

A Minimum occurs..................at 3 A.M.
A Maximum ....at 9 A.M.
A Minimum ....at 4 P.M.
And a Maximum ....at 10 P.M.

Temperature of the Air, 1869.

TABLE III.—*Mean Daily Temperature of the Air for each Day of Bombay Civil Time: also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1869. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	76·1	79·4	79·8	83·7	86·0	84·9	...	77·9	78·0	81·2	79·5
2	74·8	75·4	78·7	80·5	...	86·4	84·8	81·0	80·1	78·3	80·9	81·3
3	...	75·2	77·8	80·0	82·1	85·7	84·7	81·3	79·9	...	...	80·9
4	77·2	75·3	77·7	...	82·7	84·5	...	82·6	77·8	80·3	82·6	80·3
5	76·1	75·3	77·6	81·7	83·1	84·0	84·5	83·1	...	80·4	81·9	...
6	75·3	72·2	77·5	83·2	83·0	...	84·6	82·6	80·5	80·2	80·3	79·7
7	74·9	...	...	81·8	83·2	85·3	84·9	81·2	81·1	79·5	...	79·6
8	75·8	72·1	74·2	80·2	83·9	85·1	84·8	...	81·5	79·7	80·3	77·9
9	76·3	...	75·2	80·5	...	85·5	85·1	79·3	81·6	80·9	78·4	76·8
10	...	72·0	75·5	82·0	83·9	85·3	85·4	79·6	81·7	...	78·8	75·7
11	72·7	74·5	76·2	...	82·9	85·4	...	81·5	81·1	81·3	80·4	75·9
12	73·3	74·0	76·3	82·4	83·6	85·7	80·6	81·9	...	81·8	79·4	...
13	74·1	76·2	76·1	82·7	83·2	...	79·6	80·6	80·9	81·8	78·6	78·2
14	75·4	...	...	82·2	83·7	85·0	78·8	80·8	79·1	81·2	...	77·2
15	76·5	76·9	76·9	82·3	84·0	85·1	79·8	...	80·8	80·6	79·2	78·6
16	77·5	77·0	77·3	82·8	...	85·4	81·1	81·8	80·5	80·1	79·3	79·2
17	...	76·5	77·0	83·0	84·6	85·3	80·0	80·4	81·4	...	79·8	77·3
18	75·5	77·0	78·1	...	84·2	82·8	...	82·5	79·1	79·4	78·5	77·8
19	75·2	76·2	78·7	83·0	84·1	79·4	79·7	79·6	...	79·0	79·9	...
20	75·2	74·1	78·1	82·8	84·1	...	80·4	78·1	78·5	79·5	80·6	77·6
21	75·1	...	...	82·3	84·2	84·0	81·4	...	78·6	80·1	...	75·0
22	74·8	75·0	79·3	83·3	84·4	84·4	81·4	...	80·7	81·0	77·0	75·3
23	75·6	76·3	79·6	83·8	...	80·0	81·0	81·0	79·8	79·8	78·0	76·7
24	...	79·1	80·1	83·4	...	79·2	78·3	81·0	80·9	...	77·1	75·9
25	75·4	...	79·8	...	85·3	81·0	...	81·9	80·4	80·5	74·8	...
26	75·3	79·9	...	81·3	85·3	79·6	80·2	81·6	...	80·3	75·8	...
27	75·3	78·8	79·0	81·6	85·2	...	80·9	82·5	77·0	80·8	76·7	75·1
28	75·4	...	...	81·7	85·6	83·0	81·9	80·7	78·4	79·7	...	74·3
29	75·6		80·3	81·2	86·4	84·1	82·3	...	78·3	80·3	79·5	75·8
30	75·1		79·9	82·8	...	84·3	82·4	76·8	78·3	80·3	79·4	76·8
31	...		79·8		85·5		82·1	76·9		...		76·3
Monthly Mean.	75·3	75·7	77·9	82·0	84·1	83·9	82·1	80·8	79·8	80·2	79·1	77·5
Annual Variation.	− 4·6	− 4·2	− 2·0	+ 2·1	+ 4·2	+ 4·0	+ 2·2	+ 0·9	− 0·1	+ 0·3	− 0·8	− 2·4

	°
Mean of months from January to March, and October to December............	77·6
Mean of months from April to September	82·1
Mean for the Year..	79·9
The greatest monthly mean (that of May).................	84·1
The least monthly mean (that of January)	75·3
Difference.........	8·8

Temperature of the Air, 1869.

TABLE IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month and for the whole Year; or the Excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 2·6	− 2·7	− 2·7	− 2·4	− 2·5	− 1·5	− 1·3	− 1·1	− 1·0	− 2·1	− 2·4	− 2·2	− 2·0
1 A.M.	− 3·2	− 3·1	− 3·1	− 2·7	− 2·9	− 1·7	− 1·4	− 1·4	− 1·1	− 2·5	− 3·0	− 2·7	− 2·4
2 "	− 3·7	− 3·4	− 3·4	− 3·1	− 3·2	− 2·0	− 1·4	− 1·7	− 1·4	− 2·7	− 3·5	− 2·8	− 2·7
3 "	− 4·2	− 4·0	− 3·7	− 3·5	− 3·5	− 2·3	− 1·5	− 1·7	− 1·7	− 3·0	− 3·9	− 3·3	− 3·0
4 "	− 4·5	− 4·4	− 3·9	− 3·9	− 3·7	− 2·4	− 1·8	− 1·8	− 1·9	− 3·3	− 4·1	− 3·6	− 3·3
5 "	− 4·7	− 4·8	− 4·1	− 4·3	− 3·9	− 2·5	− 1·8	− 1·9	− 1·9	− 3·5	− 4·4	− 3·8	− 3·5
6 "	− 5·1	− 5·3	− 4·4	− 4·3	− 3·7	− 2·3	− 1·7	− 1·8	− 1·9	− 3·8	− 4·6	− 4·1	− 3·6
7 "	− 5·0	− 5·3	− 3·7	− 2·7	− 1·9	− 1·5	− 1·0	− 1·3	− 1·5	− 2·9	− 3·8	− 4·0	− 2·9
8 "	− 3·0	− 3·0	− 1·6	− 0·8	− 0·3	− 0·2	− 0·3	− 0·5	− 0·7	− 1·2	− 2·0	− 2·3	− 1·3
9 "	− 1·1	− 0·8	+ 0·4	+ 0·6	+ 0·9	+ 0·8	+ 0·6	+ 0·2	+ 0·3	+ 0·2	− 0·3	− 0·6	+ 0·1
10 "	+ 0·9	+ 1·6	+ 1·8	+ 1·9	+ 1·9	+ 1·8	+ 1·2	+ 1·1	+ 1·2	+ 1·0	+ 1·7	+ 1·0	+ 1·4
11 "	+ 2·6	+ 3·4	+ 3·1	+ 3·2	+ 2·9	+ 2·6	+ 1·9	+ 1·6	+ 2·0	+ 2·5	+ 3·2	+ 2·2	+ 2·6
NOON.	+ 4·6	+ 4·6	+ 4·4	+ 4·3	+ 3·9	+ 3·2	+ 2·4	+ 2·3	+ 2·6	+ 3·7	+ 4·9	+ 4·1	+ 3·7
1 P.M.	+ 6·3	+ 5·7	+ 5·2	+ 5·1	+ 4·7	+ 3·5	+ 2·8	+ 2·4	+ 2·8	+ 4·3	+ 6·1	+ 5·4	+ 4·5
2 "	+ 7·1	+ 6·3	+ 5·6	+ 5·2	+ 5·0	+ 3·6	+ 2·5	+ 2·6	+ 2·9	+ 4·8	+ 6·7	+ 5·9	+ 4·8
3 "	+ 7·2	+ 6·4	+ 5·6	+ 5·0	+ 4·9	+ 3·1	+ 2·3	+ 2·3	+ 2·7	+ 4·8	+ 6·5	+ 5·7	+ 4·7
4 "	+ 6·2	+ 5·7	+ 5·1	+ 4·3	+ 4·2	+ 2·6	+ 1·8	+ 1·9	+ 2·1	+ 4·3	+ 5·4	+ 4·9	+ 4·0
5 "	+ 3·9	+ 4·4	+ 3·8	+ 3·2	+ 2·8	+ 1·6	+ 0·6	+ 1·2	+ 1·0	+ 2·4	+ 2·8	+ 2·6	+ 2·5
6 "	+ 1·9	+ 1·7	+ 1·4	+ 1·1	+ 0·9	+ 0·3	+ 0·1	+ 0·5	− 0·2	+ 0·9	+ 1·3	+ 1·2	+ 0·9
7 "	+ 0·9	+ 0·6	+ 0·1	0·0	− 0·5	− 0·6	− 0·6	− 0·1	− 0·5	+ 0·1	+ 0·3	+ 0·5	0·0
8 "	+ 0·2	0·0	− 0·5	− 0·8	− 1·1	− 1·0	− 0·8	− 0·3	− 0·5	− 0·4	− 0·5	− 0·1	− 0·5
9 "	− 0·5	− 0·6	− 1·0	− 1·4	− 1·4	− 1·2	− 1·1	− 0·5	− 0·6	− 0·7	− 1·3	− 0·7	− 0·9
10 "	− 1·5	− 1·5	− 1·6	− 1·7	− 1·8	− 1·6	− 1·3	− 0·9	− 0·8	− 1·3	− 1·8	− 1·6	− 1·4
11 "	− 2·1	− 2·2	− 2·3	− 2·1	− 2·1	− 1·7	− 1·2	− 0·9	− 0·9	− 1·9	− 2·3	− 2·1	− 1·8

	°		°
Mean of the hours from 9 P.M. to 8 A.M.	77·5	} Difference =	4·8
Mean of the hours from 9 A.M. to 8 P.M.	82·3		
Mean of 24 hours	79·9		

In the Mean Diurnal Variation for the year a Maximum occurs at 2 P.M., and a Minimum at 6 A.M.

Temperature of the Ground, 1869.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1869.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
MONTH.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.
	°	°	°	°	°	°	°	°
January	76·2	– 4·6	77·0	– 4·2	79·6	– 3·2	82·1	– 1·6
February	76·4	– 4·4	77·0	– 4·2	79·0	– 3·8	81·5	– 2·2
March	78·7	– 2·1	79·0	– 2·2	80·3	– 2·5	81·8	– 1·9
April	82·8	+ 2·0	82·4	+ 1·2	83·1	+ 0·3	83·0	– 0·7
May	84·9	+ 4·1	84·4	+ 3·2	84·7	+ 1·9	84·1	+ 0·4
June	84·8	+ 4·0	85·2	+ 4·0	86·2	+ 3·4	85·4	+ 1·7
July	83·1	+ 2·3	83·7	+ 2·5	85·4	+ 2·6	85·8	+ 2·1
August	82·0	+ 1·2	82·7	+ 1·5	84·5	+ 1·7	85·3	+ 1·6
September	81·0	+ 0·2	81·7	+ 0·5	83·6	+ 0·8	84·6	+ 0·9
October	80·9	+ 0·1	81·3	+ 0·1	82·9	+ 0·1	84·0	+ 0·3
November	79·9	– 0·9	80·5	– 0·7	82·7	– 0·1	83·8	+ 0·1
December	78·6	– 2·2	79·4	– 1·8	82·0	– 0·8	83·5	– 0·2

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to March, and October to December	78·4	79·0	81·1	......
Do. of January to April, November and December	......	......	......	82·6
Do. of April to September	83·1	83·3	84·6	......
Do. of May to October	......	......	......	84·9
Do. for the Year	80·8	81·2	82·8	83·7
Greatest monthly mean (that of May)	84·9	......	......	......
Do. do. (that of June)	......	85·2	86·2	......
Do. do. (that of July)	......	......	......	85·8
Least monthly mean (that of January)	76·2	77·0	......	......
Do. do. (that of February)	......	......	79·0	81·5
Difference	8·7	8·2	7·2	4·3

Temperature of the Ground, 1869.

TABLE VI.—*Showing, for each Hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine inches respectively below the surface, and its Mean Diurnal Variation for the Year.*

1869. Bombay Civil Time.	DEPTH. 1 Inch. Mean Temperature.	1 Inch. Excess over the mean of 24 hours.	9 Inches. Mean Temperature.	9 Inches. Excess over the mean of 24 hours.
	°	°	°	°
Midnight.	79·5	− 1·3	81·2	0·0
1 A.M.	79·2	− 1·6	81·2	0·0
2 „	78·9	− 1·9	81·0	− 0·2
3 „	78·7	− 2·1	81·0	− 0·2
4 „	78·4	− 2·4	80·9	− 0·3
5 „	78·2	− 2·6	80·9	− 0·3
6 „	78·1	− 2·7	80·8	− 0·4
7 „	78·5	− 2·3	80·7	− 0·5
8 „	79·4	− 1·4	80·7	− 0·5
9 „	80·5	− 0·3	80·8	− 0·4
10 „	81·3	+ 0·5	80·9	− 0·3
11 „	82·2	+ 1·4	81·0	− 0·2
Noon.	83·1	+ 2·3	81·1	− 0·1
1 P.M.	83·7	+ 2·9	81·3	+ 0·1
2 „	84·0	+ 3·2	81·4	+ 0·2
3 „	84·1	+ 3·3	81·5	+ 0·3
4 „	83·8	+ 3·0	81·6	+ 0·4
5 „	82·9	+ 2·1	81·6	+ 0·4
6 „	81·9	+ 1·1	81·6	+ 0·4
7 „	81·3	+ 0·5	81·5	+ 0·3
8 „	80·9	+ 0·1	81·5	+ 0·3
9 „	80·5	− 0·3	81·4	+ 0·2
10 „	80·1	− 0·7	81·3	+ 0·1
11 „	79·7	− 1·1	81·3	+ 0·1

	DEPTH. 1 Inch.	DEPTH. 9 Inches.
	°	°
Mean of hours from 10 P.M. to 9 A.M.	79·1	......
Ditto 10 A.M. to 9 P.M.	82·5	......
Ditto 1 A.M. to Noon	......	80·9
Ditto 1 P.M. to Midnight	......	81·4
Mean of 24 hours	80·8	81·2
Maximum at 3 P.M.	84·1	......
Ditto 6 P.M.	......	81·6
Minimum at 6 A.M.	78·1	......
Ditto 7 or 8 A.M.	......	80·7
Difference	6·0	0·9

Temperature of Evaporation, 1869.

TABLE VII.—*Mean Temperature of Evaporation for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1869. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	69·0	69·5	74·5	76·5	80·7	79·8	...	76·2	75·8	75·5	75·2
2	69·9	68·5	71·7	74·4	...	80·5	79·2	77·5	77·0	76·1	75·6	76·4
3	...	68·2	72·4	74·9	77·1	79·8	79·1	77·8	76·3	...	...	75·8
4	71·5	66·1	72·4	...	77·2	79·2	...	78·2	75·8	76·0	76·4	74·1
5	68·4	68·1	72·9	76·3	77·1	78·1	78·8	78·8	...	75·6	73·6	...
6	66·6	65·4	72·9	74·5	77·6	...	78·9	78·4	77·1	75·8	70·7	70·9
7	66·5	...	...	73·8	78·0	79·2	79·1	77·8	77·3	74·5	...	70·2
8	68·7	63·9	65·6	74·1	78·2	79·3	79·2	...	77·2	75·6	70·8	67·3
9	69·9	...	65·7	76·0	...	79·2	79·2	77·5	77·0	77·1	69·6	66·0
10	...	61·4	67·6	77·2	77·6	79·1	79·2	78·0	77·1	...	70·2	67·1
11	68·8	65·6	69·0	...	77·2	78·4	...	78·9	77·0	77·5	70·8	68·7
12	68·4	67·9	69·3	77·8	77·2	78·9	78·0	78·8	...	76·5	71·8	...
13	67·6	69·3	69·6	77·3	77·0	...	77·2	77·9	77·2	76·2	71·0	70·0
14	68·1	...	...	76·7	76·8	77·9	77·2	77·6	76·6	75·2	...	70·3
15	68·2	70·8	70·5	76·8	77·6	77·3	77·4	...	77·4	73·9	73·8	71·1
16	68·8	68·1	70·8	77·4	...	78·0	77·9	78·4	76·9	73·9	73·5	74·5
17	...	68·5	70·4	77·9	77·9	78·2	77·3	77·5	77·7	...	72·0	73·8
18	68·4	67·6	72·2	...	77·0	78·7	...	77·9	76·9	75·2	64·8	73·8
19	67·1	68·2	71·5	77·4	76·5	77·0	77·6	77·0	...	75·0	67·9	...
20	66·6	68·3	71·2	77·2	76·5	...	77·7	76·4	77·0	75·0	70·5	72·4
21	67·0	...	...	77·0	76·1	79·2	78·0	...	76·8	74·7	...	66·7
22	67·5	68·6	73·9	77·5	76·9	79·5	77·5	...	76·7	73·2	71·3	68·0
23	69·1	67·6	73·9	76·8	...	78·0	77·4	76·7	76·3	72·9	69·7	70·8
24	...	72·4	73·7	74·9	...	77·1	76·6	76·9	76·8	...	65·9	68·1
25	69·8	...	71·8	...	78·7	78·1	...	77·1	76·9	74·8	63·8	...
26	69·3	71·5	...	74·0	78·3	78·0	77·2	77·0	...	74·1	65·2	...
27	70·0	73·6	72·5	75·1	78·1	...	77·4	77·5	75·6	74·1	64·8	70·8
28	70·8	...	...	75·0	79·5	80·0	77·9	77·0	76·2	73·7	...	68·9
29	70·2		72·4	75·6	80·2	80·1	78·1	...	76·6	74·8	74·2	71·2
30	69·6		73·6	76·4	...	79·7	77·9	75·4	76·4	75·3	74·6	71·7
31	...		73·6		79·2		77·7	75·9		...		71·3
Monthly Mean.	68·7	68·1	71·2	76·0	77·6	78·8	78·1	77·5	76·8	75·1	70·7	71·0
Annual Variation.	− 5·4	− 6·0	− 2·9	+ 1·9	+ 3·5	+ 4·7	+ 4·0	+ 3·4	+ 2·7	+ 1·0	− 3·4	− 3·1

Mean of months from January to March, and October to December......	° 70·8
Mean of months from April to September	77·5
Mean for the Year..	74·1
The greatest monthly mean (that of June)	78·8
The least monthly mean (that of February)	68·1
Difference	10·7

Temperature of Evaporation, 1869.

TABLE VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	– 0·9	– 1·0	– 0·9	– 0·5	– 0·8	– 0·6	– 0·3	– 0·6	– 0·5	– 0·9	+ 0·1	– 0·5	– 0·6
1 A.M.	– 1·1	– 0·8	– 1·1	– 0·8	– 0·9	– 0·7	– 0·5	– 0·7	– 0·5	– 0·9	– 0·2	– 0·6	– 0·7
2 „	– 2·2	– 0·9	– 1·0	– 1·1	– 1·1	– 0·8	– 0·6	– 0·7	– 0·7	– 1·1	– 0·7	– 0·8	– 1·0
3 „	– 2·2	– 1·2	– 1·2	– 1·4	– 1·3	– 0·9	– 0·7	– 0·8	– 1·0	– 1·4	– 1·3	– 1·3	– 1·2
4 „	– 2·3	– 1·5	– 1·5	– 1·4	– 1·5	– 1·0	– 1·0	– 0·8	– 1·2	– 1·6	– 1·6	– 1·7	– 1·4
5 „	– 3·0	– 2·0	– 1·4	– 1·7	– 1·6	– 1·0	– 0·9	– 0·9	– 1·1	– 1·9	– 1·8	– 1·9	– 1·6
6 „	– 3·1	– 2·8	– 1·7	– 1·8	– 1·6	– 1·0	– 0·9	– 0·9	– 1·1	– 2·0	– 2·4	– 2·0	– 1·8
7 „	– 3·5	– 3·0	– 1·3	– 1·0	– 0·9	– 0·6	– 0·4	– 0·4	– 0·7	– 1·3	– 2·2	– 1·7	– 1·4
8 „	– 2·2	– 2·2	– 0·7	– 0·5	– 0·3	– 0·1	+ 0·1	0·0	– 0·2	– 0·3	– 1·8	– 1·4	– 0·8
9 „	– 1·2	– 1·7	– 0·3	+ 0·1	+ 0·2	+ 0·3	+ 0·4	+ 0·4	+ 0·4	+ 0·1	– 1·7	– 1·0	– 0·3
10 „	– 0·4	– 0·6	+ 0·4	+ 0·5	+ 0·7	+ 0·7	+ 0·7	+ 0·9	+ 0·8	+ 0·1	– 1·0	– 0·7	+ 0·2
11 „	– 0·3	+ 0·1	+ 1·0	+ 1·0	+ 0·9	+ 1·0	+ 1·1	+ 0·9	+ 1·4	+ 0·8	– 0·8	– 0·3	+ 0·6
Noon.	+ 1·0	+ 1·1	+ 1·6	+ 1·4	+ 1·3	+ 1·3	+ 1·1	+ 1·0	+ 1·5	+ 1·2	– 0·4	–0·1	+ 1·0
1 P.M.	+ 1·8	+ 2·1	+ 1·9	+ 1·7	+ 1·6	+ 1·4	+ 1·2	+ 1·2	+ 1·5	+ 1·7	+ 0·3	+ 0·6	+ 1·4
2 „	+ 3·3	+ 2·9	+ 1·9	+ 1·8	+ 1·7	+ 1·5	+ 1·1	+ 1·2	+ 1·5	+ 2·2	+ 1·1	+ 2·0	+ 1·8
3 „	+ 3·8	+ 3·1	+ 1·8	+ 1·6	+ 1·7	+ 1·2	+ 1·0	+ 0·9	+ 1·1	+ 2·1	+ 1·7	+ 2·4	+ 1·9
4 „	+ 3·7	+ 2·8	+ 1·6	+ 1·5	+ 1·4	+ 0·9	+ 0·7	+ 0·8	+ 0·8	+ 1·9	+ 2·7	+ 2·3	+ 1·8
5 „	+ 2·8	+ 2·2	+ 1·2	+ 1·0	+ 1·1	+ 0·6	+ 0·1	+ 0·4	0·0	+ 0·9	+ 2·4	+ 1·8	+ 1·2
6 „	+ 2·1	+ 1·5	+ 0·5	+ 0·3	+ 0·3	+ 0·1	0·0	+ 0·1	– 0·4	+ 0·6	+ 2·4	+ 1·5	+ 0·7
7 „	+ 2·1	+ 1·2	+ 0·1	– 0·1	0·0	– 0·1	– 0·3	– 0·3	– 0·5	+ 0·5	+ 1·9	+ 1·3	+ 0·5
8 „	+ 1·6	+ 1·1	– 0·2	0·0	0·0	– 0·2	– 0·3	– 0·3	– 0·5	+ 0·4	+ 1·8	+ 1·2	+ 0·4
9 „	+ 0·7	+ 0·9	– 0·2	– 0·1	– 0·2	– 0·3	– 0·6	– 0·2	– 0·4	+ 0·2	+ 1·3	+ 0·7	+ 0·1
10 „	– 0·4	– 0·1	– 0·3	0·0	– 0·4	– 0·3	– 0·5	– 0·5	– 0·6	– 0·5	+ 0·6	– 0·1	– 0·3
11 „	– 1·0	– 0·7	– 0·6	– 0·2	– 0·5	– 0·6	– 0·4	– 0·4	– 0·5	– 1·1	– 0·1	– 0·4	– 0·5

Mean of the hours from 10 P.M. to 9 A.M.	73°·1
Mean of the hours from 10 A.M. to 9 P.M.	75·1
Mean of 24 hours	74·1

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M., and a Minimum at 6 A.M.

Temperature of Dew-point, 1869.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1869.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	65·5	64·7	72·4	73·7	79·0	78·0	...	75·6	74·9	73·3	73·6
2	67·6	65·1	68·5	71·9	...	78·5	77·3	76·2	75·9	75·2	73·5	74·6
3	...	64·6	70·0	72·8	75·3	77·9	77·2	76·6	75·0	...	...	73·8
4	69·0	61·2	70·1	...	75·2	77·4	...	76·7	75·1	74·3	74·0	71·7
5	64·6	64·5	71·0	74·2	74·9	76·1	76·8	77·3	...	73·7	69·8	...
6	61·9	61·6	70·9	71·0	75·6	...	77·0	77·0	75·9	74·1	66·3	66·7
7	61·9	...	...	70·4	76·0	77·0	77·2	76·6	75·9	72·6	...	65·5
8	65·3	59·2	61·0	71·7	76·2	77·3	77·2	...	75·6	74·0	66·3	61·4
9	66·9	...	60·4	74·3	...	77·0	77·1	76·9	75·3	75·6	65·3	60·0
10	...	54·5	63·6	75·5	75·2	76·9	77·1	77·4	75·4	...	66·1	62·5
11	66·9	60·5	65·5	...	75·1	76·0	...	78·0	75·5	76·2	66·1	65·2
12	66·1	64·7	66·0	76·1	74·8	76·5	77·1	77·8	...	74·5	68·3	...
13	64·3	66·0	66·4	75·4	74·8	...	76·3	76·9	75·9	74·0	67·5	66·0
14	64·5	...	...	74·7	74·3	75·3	76·7	76·4	75·7	72·8	...	67·1
15	63·9	67·9	67·5	74·7	75·3	74·5	76·5	...	76·1	71·1	71·6	67·7
16	64·3	63·5	67·9	75·4	...	75·4	76·8	77·3	75·6	71·3	71·1	72·6
17	...	64·5	67·4	76·0	75·4	75·6	76·4	76·5	76·4	...	68·4	72·3
18	64·9	62·7	69·6	...	74·3	77·3	...	76·2	76·1	73·6	56·6	72·2
19	62·8	64·2	68·2	75·3	73·5	76·1	76·9	76·1	...	73·5	61·4	...
20	61·9	65·5	68·1	75·1	73·6	...	76·7	75·8	76·4	73·2	65·5	70·2
21	62·7	...	...	75·1	73·0	77·6	76·8	...	76·1	72·5	...	62·2
22	63·8	65·5	71·8	75·4	74·2	77·9	76·2	...	75·2	69·9	68·7	64·5
23	65·9	63·0	71·6	74·1	...	77·2	76·2	75·1	75·0	70·0	65·4	68·1
24	...	69·5	71·0	71·5	...	76·3	75·9	75·4	75·4	...	59·7	64·2
25	67·1	...	68·2	...	76·4	77·0	...	75·3	75·6	72·6	57·0	...
26	66·5	67·6	...	70·9	75·8	77·4	76·2	75·3	...	71·5	58·8	...
27	67·6	71·3	69·7	72·6	75·6	...	76·2	75·7	75·1	71·4	57·5	68·8
28	68·7	...	...	72·3	77·4	79·1	76·4	75·6	75·4	71·3	...	66·4
29	67·7		69·0	73·4	78·1	78·8	76·6	...	76·0	72·6	72·0	69·2
30	67·0		71·0	74·0	...	78·2	76·3	74·9	75·6	73·4	72·7	69·5
31	...		71·1		77·1		76·2	75·5		...		69·1
Monthly Mean.	65·4	64·2	68·1	73·7	75·2	77·1	76·7	76·3	75·7	73·1	66·5	67·9
Annual Variation.	− 6·3	− 7·5	− 3·6	+ 2·0	+ 3·5	+ 5·4	+ 5·0	+ 4·6	+ 4·0	+ 1·4	− 5·2	− 3·8

	°
Mean of months from January to March, and October to December...............	67·5
Mean of months from April to September..	75·8
Mean for the Year	71·7
The greatest monthly mean (that of June)	77·1
The least monthly mean (that of February)	64·2
Difference	12·9

Temperature of Dew-point, 1869.

TABLE X.—*The Mean Diurnal Variation of the Temperature of the Dew-point for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Dew-point above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	o	o	o	o	o	o	o	o	o	o	o	o	o
Midnight.	− 0·1	− 0·3	− 0·2	+ 0·3	− 0·1	− 0·3	0·0	− 0·4	− 0·3	− 0·5	+ 1·5	+ 0·3	0·0
1 A.M.	− 0·2	+ 0·3	− 0·2	− 0·1	− 0·1	− 0·5	− 0·2	− 0·4	− 0·4	− 0·4	+ 1·2	+ 0·4	0·0
2 „	− 1·7	+ 0·3	0·0	− 0·4	− 0·4	− 0·5	− 0·4	− 0·3	− 0·4	− 0·5	+ 0·8	+ 0·2	− 0·3
3 „	− 1·3	+ 0·2	0·0	− 0·7	− 0·5	− 0·5	− 0·5	− 0·5	− 0·7	− 0·8	− 0·1	− 0·4	− 0·5
4 „	− 1·4	− 0·2	− 0·4	− 0·5	− 0·7	− 0·7	− 0·8	− 0·5	− 0·9	− 1·0	− 0·5	− 0·8	− 0·7
5 „	− 2·3	− 0·8	− 0·3	− 0·8	− 0·8	− 0·6	− 0·6	− 0·6	− 0·8	− 1·3	− 0·7	− 1·0	− 0·9
6 „	− 2·3	− 1·9	− 0·4	− 0·9	− 0·8	− 0·6	− 0·7	− 0·5	− 0·8	− 1·4	− 1·3	− 1·1	− 1·1
7 „	− 3·0	− 2·2	− 0·3	− 0·4	− 0·5	− 0·3	− 0·2	0·0	− 0·4	− 0·7	− 1·6	− 0·7	− 0·9
8 „	− 2·0	− 2·0	− 0·3	− 0·4	− 0·3	− 0·1	+ 0·2	+ 0·2	− 0·1	+ 0·1	− 2·0	− 1·0	− 0·6
9 „	− 1·4	− 2·6	− 0·6	− 0·2	− 0·1	0·0	+ 0·4	+ 0·5	+ 0·4	+ 0·1	− 2·8	− 1·4	− 0·6
10 „	− 1·2	− 2·0	− 0·3	− 0·1	+ 0·2	+ 0·1	+ 0·5	+ 0·8	+ 0·7	− 0·4	− 2·8	− 1·6	− 0·5
11 „	− 2·0	− 1·9	0·0	+ 0·2	+ 0·3	+ 0·4	+ 0·8	+ 0·7	+ 1·2	+ 0·1	− 3·2	− 1·7	− 0·4
Noon.	− 0·7	− 0·9	+ 0·5	+ 0·4	+ 0·4	+ 0·6	+ 0·7	+ 0·6	+ 1·1	+ 0·2	− 3·5	− 2·5	− 0·3
1 P.M.	− 0·3	+ 0·4	+ 0·6	+ 0·4	+ 0·6	+ 0·7	+ 0·6	+ 0·8	+ 1·1	+ 0·7	− 2·8	− 1·9	+ 0·1
2 „	+ 1·8	+ 1·5	+ 0·3	+ 0·5	+ 0·6	+ 0·7	+ 0·7	+ 0·7	+ 1·1	+ 1·3	− 1·5	+ 0·5	+ 0·7
3 „	+ 2·7	+ 1·8	+ 0·2	+ 0·4	+ 0·6	+ 0·5	+ 0·6	+ 0·5	+ 0·6	+ 1·2	− 0·5	+ 0·8	+ 0·8
4 „	+ 3·0	+ 1·7	+ 0·2	+ 0·5	+ 0·6	+ 0·3	+ 0·4	+ 0·5	+ 0·4	+ 1·1	+ 2·0	+ 1·4	+ 1·0
5 „	+ 2·6	+ 1·4	+ 0·1	+ 0·2	+ 0·5	+ 0·2	− 0·1	+ 0·2	− 0·3	+ 0·3	+ 2·7	+ 1·7	+ 0·8
6 „	+ 2·5	+ 1·6	+ 0·1	0·0	+ 0·1	− 0·1	0·0	− 0·1	− 0·5	+ 0·6	+ 3·3	+ 1·8	+ 0·8
7 „	+ 3·0	+ 1·6	+ 0·1	− 0·1	+ 0·3	0·0	− 0·2	− 0·4	− 0·5	+ 0·7	+ 3·1	+ 1·9	+ 0·8
8 „	+ 2·5	+ 1·8	− 0·1	+ 0·3	+ 0·4	0·0	− 0·1	− 0·3	− 0·5	+ 0·7	+ 3·2	+ 1·9	+ 0·8
9 „	+ 1·4	+ 1·8	+ 0·2	+ 0·4	+ 0·3	− 0·1	− 0·4	− 0·2	− 0·3	+ 0·5	+ 2·8	+ 1·5	+ 0·7
10 „	+ 0·2	+ 0·6	+ 0·3	+ 0·6	+ 0·2	0·0	− 0·2	− 0·3	− 0·5	− 0·3	+ 1·9	+ 0·7	+ 0·3
11 „	− 0·5	0·0	+ 0·1	+ 0·5	0·0	− 0·4	− 0·2	− 0·3	− 0·3	− 0·9	+ 1·2	+ 0·4	0·0

	o
Mean of the hours from 1 A.M. to Noon	71·1
Mean of the hours from 1 P.M. to Midnight..................	72·3
Mean of 24 hours	71·7

In the Mean Diurnal Variation for the year a Maximum occurs at 4 P.M., and a Minimum at 6 A.M.

Maxima and Minima of different Meteorological Elements, 1869.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1869, *which showed the greatest and the least values of the following elements, viz., Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1869. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	o	o	o	o	o	o	o	o	o
January	30·132	29·817	0·315	87·5	67·3	20·2	75·3	60·6	14·7	72·2	53·8	18·4
February	·057	·824	·233	87·3	63·3	24·0	78·2	53·8	24·4	76·0	43·0	33·0
March	·002	·755	·247	86·0	69·0	17·0	76·2	62·7	13·5	73·4	56·4	17·0
April	29·991	·675	·316	89·6	74·7	14·9	80·2	70·1	10·1	78·0	64·5	13·5
May	·916	·603	·313	91·1	77·7	13·4	82·6	73·5	9·1	80·1	70·2	9·9
June...........	·878	·467	·411	92·4	76·2	16·2	83·1	75·2	7·9	80·9	72·8	8·1
July...........	·788	·463	·325	90·4	76·1	14·3	81·7	74·3	7·4	79·3	73·5	5·8
August.........	·825	·575	·250	87·2	75·2	12·0	81·6	74·1	7·5	80·2	73·6	6·6
September ...	·868	·516	·352	87·0	74·3	12·7	80·2	73·3	6·9	79·2	72·3	6·9
October	·992	·689	·303	88·1	73·8	14·3	80·2	68·1	12·1	78·0	60·0	18·0
November ...	30·052	·775	·277	90·3	67·3	23·0	79·2	57·5	21·7	76·0	46·6	29·4
December ...	·034	·763	·271	88·1	68·5	19·6	79·2	60·4	18·8	76·9	42·5	34·4
Year...........	30·132	29·463	0·669	92·4	63·3	29·1	83·1	53·8	29·3	80·9	42·5	38·4

Pressure of Vapour, 1869.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time: also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1869. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·630	0·613	0·795	0·832	0·990	0·959	...	0·884	0·866	0·821	0·827
2	0·676	·622	·701	·785	...	·975	·937	0·903	·895	·874	·826	·856
3	...	·611	·735	·807	·876	·954	·932	·914	·869	...	...	·833
4	·710	·542	·735	...	·873	·941	...	·917	·871	·848	·840	·776
5	·610	·613	·758	·846	·864	·899	·921	·935	...	·831	·735	...
6	·558	·552	·757	·758	·885	...	·927	·926	·894	·842	·650	·659
7	·559	...	...	·744	·899	·928	·932	·916	·894	·800	...	·633
8	·629	·503	·536	·777	·902	·938	·933	...	·884	·841	·650	·553
9	·663	...	·527	·849	...	·929	·930	·923	·876	·887	·627	·521
10	...	·433	·588	·884	·873	·925	·932	·941	·879	...	·645	·570
11	·660	·533	·628	...	·871	·896	...	·959	·884	·902	·650	·622
12	·643	·618	·639	·900	·863	·912	·931	·953	...	·853	·694	...
13	·603	·642	·650	·879	·861	...	·904	·925	·894	·841	·675	·643
14	·611	...	...	·860	·848	·877	·917	·910	·889	·808	...	·667
15	·597	·689	·673	·861	·876	·853	·911	...	·902	·762	·774	·683
16	·608	·590	·681	·881	...	·878	·922	·936	·884	·769	·761	·802
17	...	·610	·670	·898	·881	·886	·909	·913	·910	...	·697	·794
18	·617	·572	·724	...	·848	·937	...	·903	·901	·828	·461	·790
19	·576	·602	·691	·877	·827	·901	·925	·900	...	·825	·553	...
20	·557	·627	·688	·870	·828	...	·918	·892	·909	·818	·636	·739
21	·578	...	...	·870	·812	·945	·921	...	·900	·800	...	·561
22	·595	·628	·779	·879	·844	·955	·902	...	·874	·734	·702	·609
23	·639	·583	·775	·845	...	·934	·903	·869	·867	·736	·633	·689
24	...	·724	·760	·773	...	·908	·895	·879	·878	...	·519	·600
25	·666	...	·692	...	·909	·932	...	·878	·885	·801	·473	...
26	·651	·679	...	·757	·892	·941	·902	·876	...	·773	·506	...
27	·676	·769	·726	·800	·886	...	·903	·887	·871	·770	·489	·704
28	·703	...	...	·785	·939	·992	·910	·887	·880	·766	...	·649
29	·677		·711	·822	·960	·983	·915	...	·896	·801	·785	·713
30	·663		·757	·840	...	·965	·908	·866	·886	·822	·803	·722
31	...		·761		·930		·903	·881		...		·710
Monthly Mean.	0·629	0·608	0·691	0·832	0·875	0·930	0·919	0·908	0·887	0·815	0·664	0·689
Annual Variation.	−0·158	−0·179	−0·096	+0·045	+0·088	+0·143	+0·132	+0·121	+0·100	+0·028	−0·123	−0·098

	in.
Mean of months from January to March, and October to December	0·683
Mean of months from April to September..	0·892
Mean for the Year	0·787
The greatest monthly mean (that of June)	0·930
The least monthly mean (that of February)	0·608
Difference...........	0·322

Pressure of Vapour, 1869.

TABLE XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1869.	MONTH.												Year.
Bombay Civil Time.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	−0·001	−0·005	−0·003	+0·007	−0·005	−0·010	+0·001	−0·013	−0·009	−0·012	+0·030	+0·007	−0·001
1 A.M.	− ·004	+ ·005	− ·003	− ·003	− ·006	− ·014	− ·007	− ·015	− ·009	− ·010	+ ·024	+ ·009	− ·003
2 „	− ·035	+ ·006	·000	− ·012	− ·012	− ·013	− ·012	− ·012	− ·011	− ·013	+ ·014	+ ·004	− ·008
3 „	− ·028	+ ·002	− ·001	− ·018	− ·016	− ·015	− ·016	− ·015	− ·020	− ·021	− ·001	− ·010	− ·013
4 „	− ·030	− ·004	− ·010	− ·014	− ·021	− ·020	− ·024	− ·016	− ·026	− ·026	− ·012	− ·019	− ·018
5 „	− ·049	− ·018	− ·007	− ·023	− ·025	− ·016	− ·021	− ·020	− ·023	− ·034	− ·015	− ·022	− ·023
6 „	− ·049	− ·040	− ·011	− ·025	− ·024	− ·018	− ·022	− ·017	− ·022	− ·036	− ·028	− ·026	− ·026
7 „	− ·062	− ·044	− ·006	− ·012	− ·016	− ·010	− ·008	− ·003	− ·011	− ·020	− ·037	− ·016	− ·020
8 „	− ·042	− ·043	− ·006	− ·010	− ·009	− ·004	+ ·004	+ ·004	− ·001	+ ·003	− ·044	− ·024	− ·014
9 „	− ·030	− ·052	− ·014	− ·004	− ·003	+ ·002	+ ·010	+ ·015	+ ·012	+ ·004	− ·057	− ·030	− ·012
10 „	− ·024	− ·041	− ·006	− ·001	+ ·007	+ ·009	+ ·015	+ ·022	+ ·022	− ·007	− ·055	− ·034	− ·008
11 „	− ·041	− ·037	+ ·001	+ ·006	+ ·007	+ ·014	+ ·024	+ ·021	+ ·036	+ ·006	− ·064	− ·036	− ·005
Noon.	− ·015	− ·016	+ ·011	+ ·012	+ ·011	+ ·020	+ ·022	+ ·017	+ ·035	+ ·008	− ·070	− ·046	− ·001
1 P.M.	− ·004	+ ·009	+ ·014	+ ·012	+ ·017	+ ·022	+ ·020	+ ·022	+ ·033	+ ·020	− ·059	− ·033	+ ·006
2 „	+ ·039	+ ·031	+ ·007	+ ·015	+ ·017	+ ·024	+ ·019	+ ·020	+ ·034	+ ·035	− ·035	+ ·012	+ ·018
3 „	+ ·059	+ ·037	+ ·005	+ ·013	+ ·018	+ ·016	+ ·017	+ ·013	+ ·019	+ ·032	− ·012	+ ·020	+ ·020
4 „	+ ·067	+ ·033	+ ·004	+ ·015	+ ·016	+ ·012	+ ·011	+ ·014	+ ·012	+ ·030	+ ·041	+ ·031	+ ·024
5 „	+ ·055	+ ·026	+ ·001	+ ·007	+ ·015	+ ·006	− ·003	+ ·004	− ·008	+ ·008	+ ·056	+ ·038	+ ·017
6 „	+ ·054	+ ·031	+ ·003	·000	+ ·003	− ·001	− ·001	− ·003	− ·014	+ ·016	+ ·070	+ ·041	+ ·017
7 „	+ ·065	+ ·033	+ ·001	− ·002	+ ·007	·000	− ·007	− ·013	− ·013	+ ·018	+ ·065	+ ·043	+ ·016
8 „	+ ·054	+ ·036	− ·004	+ ·008	+ ·010	+ ·002	− ·004	− ·009	− ·014	+ ·020	+ ·069	+ ·043	+ ·018
9 „	+ ·029	+ ·035	+ ·004	+ ·012	+ ·009	− ·001	− ·012	− ·006	− ·009	+ ·014	+ ·060	+ ·034	+ ·014
10 „	+ ·004	+ ·011	+ ·006	+ ·018	+ ·005	+ ·001	− ·007	− ·011	− ·013	− ·007	+ ·039	+ ·015	+ ·005
11 „	− ·009	·000	+ ·002	+ ·015	·000	− ·010	− ·006	− ·010	− ·008	− ·024	+ ·023	+ ·009	− ·001

	in.
Mean of the hours from Midnight to 11 A.M.	0·774
Mean of the hours from Noon to 11 P.M.	0·800
Mean of 24 hours	0·787

In the Mean Diurnal Variation for the year a Maximum occurs at 4 P.M., and a Minimum at 6 A.M.

Relative Humidity of the Air, 1869.

TABLE XIV.—*Mean Relative Humidity of the Air for each Day of Bombay Civil Time: also the Monthly Mean Relative Humidity and its Variation from the Mean of the Year.*

1869.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	0·710	0·614	0·788	0·729	0·799	0·803	...	0·926	0·903	0·778	0·814
2	0·787	·712	·718	·759	...	·779	·784	0·846	·871	·903	·790	·806
3	...	·707	·779	·792	·803	·782	·784	·859	·851	...	...	·797
4	·764	·623	·779	...	·787	·796	...	·828	·916	·823	·760	·754
5	·682	·695	·805	·787	·768	·771	·778	·826	...	·803	·687	...
6	·637	·701	·806	·675	·786	...	·783	·834	·859	·818	·641	·656
7	·647	...	...	·692	·793	·765	·780	·860	·843	·796	...	·634
8	·708	·644	·641	·754	·779	·778	·781	...	·823	·832	·638	·588
9	·747	...	·611	·818	...	·763	·773	·924	·815	·843	·652	·573
10	...	·553	·670	·819	·754	·765	·768	·932	·813	...	·662	·650
11	·826	·637	·705	...	·777	·737	...	·894	·834	·846	·635	·701
12	·788	·737	·711	·817	·757	·744	·894	·877	...	·790	·700	...
13	·719	·718	·725	·787	·763	...	·897	·886	·849	·780	·691	·672
14	·694	...	...	·788	·739	·731	·934	·869	·895	·764	...	·718
15	·660	·749	·732	·785	·755	·707	·896	...	·861	·735	·780	·698
16	·652	·641	·734	·790	...	·724	·872	·865	·853	·750	·765	·808
17	...	·669	·727	·800	·745	·732	·890	·885	·850	...	·695	·847
18	·700	·620	·757	...	·727	·835	...	·813	·908	·830	·486	·833
19	·657	·673	·710	·781	·708	·899	·912	·891	...	·836	·543	...
20	·641	·748	·720	·780	·710	...	·886	·928	·931	·813	·614	·783
21	·663	...	...	·792	·695	·812	·858	...	·920	·780	...	·654
22	·691	·728	·782	·777	·717	·811	·842	...	·835	·692	·762	·696
23	·728	·643	·772	·734	...	·912	·856	·823	·852	·730	·676	·754
24	...	·736	·743	·681	...	·912	·924	·831	·835	...	·561	·678
25	·758	...	·684	...	·751	·880	...	·808	·854	·778	·551	...
26	·750	·666	...	·712	·738	·930	·876	·812	...	·754	·580	...
27	·776	·785	·739	·746	·735	...	·859	·801	·941	·739	·528	·811
28	·803	...	...	·736	·767	·879	·838	·847	·909	·758	...	·769
29	·773		·693	·776	·765	·841	·830	...	·928	·776	·783	·803
30	·763		·746	·753	...	·821	·823	·940	·916	·798	·800	·786
31	...		·753		·762		·826	·954		...		·786
Monthly Mean.	0·720	0·686	0·725	0·766	0·752	0·804	0·842	0·866	0·873	0·795	0·670	0·733
Annual Variation.	− ·049	− ·083	− ·044	− ·003	− ·017	+ ·035	+ ·073	+ ·097	+ ·104	+ ·026	− ·099	− ·036

Mean of the months from January to April, November and December	·717
Mean of the months from May to October......................................	·822
Mean for the Year..	·769
The greatest monthly mean (that of September)	·873
The least monthly mean (that of November)	·670
Difference...........	·203

Relative Humidity of the Air, 1869.

TABLE XV.—*The Mean Diurnal Variation of Relative Humidity of the Air for each Month, and for the whole Year; or the Excess of the Mean Hourly Relative Humidity above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	+ ·062	+ ·052	+ ·059	+ ·065	+ ·055	+ ·030	+ ·034	+ ·018	+ ·022	+ ·040	+ ·082	+ ·058	+ ·048
1 A.M.	+ ·074	+ ·076	+ ·069	+ ·063	+ ·065	+ ·031	+ ·030	+ ·025	+ ·022	+ ·054	+ ·088	+ ·071	+ ·056
2 „	+ ·046	+ ·085	+ ·082	+ ·064	+ ·067	+ ·039	+ ·025	+ ·037	+ ·030	+ ·056	+ ·088	+ ·068	+ ·057
3 „	+ ·068	+ ·096	+ ·088	+ ·069	+ ·071	+ ·045	+ ·022	+ ·033	+ ·029	+ ·054	+ ·081	+ ·066	+ ·060
4 „	+ ·075	+ ·096	+ ·084	+ ·083	+ ·073	+ ·044	+ ·025	+ ·035	+ ·029	+ ·058	+ ·074	+ ·065	+ ·062
5 „	+ ·056	+ ·091	+ ·094	+ ·085	+ ·074	+ ·049	+ ·027	+ ·034	+ ·031	+ ·055	+ ·077	+ ·065	+ ·061
6 „	+ ·066	+ ·075	+ ·098	+ ·085	+ ·070	+ ·042	+ ·023	+ ·035	+ ·033	+ ·061	+ ·063	+ ·065	+ ·060
7 „	+ ·046	+ ·066	+ ·084	+ ·053	+ ·030	+ ·029	+ ·019	+ ·033	+ ·033	+ ·053	+ ·039	+ ·076	+ ·047
8 „	+ ·021	+ ·014	+ ·031	+ ·007	− ·004	+ ·001	+ ·009	+ ·016	+ ·021	+ ·032	− ·006	+ ·028	+ ·014
9 „	− ·011	− ·045	− ·026	− ·023	− ·028	− ·018	− ·009	+ ·011	+ ·002	− ·004	− ·060	− ·022	− ·019
10 „	− ·050	− ·084	− ·050	− ·050	− ·042	− ·038	− ·020	− ·011	− ·011	− ·036	− ·093	− ·059	− ·045
11 „	− ·102	− ·115	− ·072	− ·073	− ·064	− ·052	− ·030	− ·026	− ·021	− ·053	− ·128	− ·097	− ·069
Noon.	− ·117	− ·116	− ·091	− ·091	− ·083	− ·058	− ·044	− ·045	− ·038	− ·082	− ·160	− ·133	− ·088
1 P.M.	− ·136	− ·112	− ·104	− ·108	− ·095	− ·065	− ·057	− ·045	− ·044	− ·086	− ·169	− ·144	− ·097
2 „	− ·113	− ·104	− ·117	− ·107	− ·100	− ·065	− ·045	− ·050	− ·045	− ·084	− ·159	− ·117	− ·092
3 „	− ·099	− ·099	− ·117	− ·102	− ·098	− ·060	− ·043	− ·048	− ·054	− ·087	− ·138	− ·108	− ·088
4 „	− ·074	− ·090	− ·109	− ·090	− ·084	− ·048	− ·035	− ·039	− ·047	− ·079	− ·074	− ·082	− ·071
5 „	− ·034	− ·070	− ·085	− ·075	− ·056	− ·034	− ·018	− ·028	− ·033	− ·056	− ·009	+ ·026	− ·039
6 „	+ ·010	− ·010	− ·033	− ·033	− ·023	− ·010	·000	− ·020	− ·008	− ·010	+ ·041	+ ·010	− ·007
7 „	+ ·048	+ ·019	− ·005	− ·004	+ ·017	+ ·014	+ ·010	− ·010	·000	+ ·013	+ ·057	+ ·029	+ ·016
8 „	+ ·053	+ ·036	+ ·004	+ ·025	+ ·032	+ ·026	+ ·018	− ·001	+ ·002	+ ·026	+ ·080	+ ·044	+ ·029
9 „	+ ·044	+ ·053	+ ·026	+ ·042	+ ·040	+ ·029	+ ·018	+ ·008	+ ·010	+ ·028	+ ·083	+ ·049	+ ·036
10 „	+ ·038	+ ·044	+ ·042	+ ·056	+ ·045	+ ·041	+ ·027	+ ·013	+ ·012	+ ·024	+ ·077	+ ·048	+ ·039
11 „	+ ·039	+ ·046	+ ·054	+ ·063	+ ·048	+ ·036	+ ·028	+ ·016	+ ·019	+ ·023	+ ·073	+ ·057	+ ·042

Mean of the hours from 8 A.M. to 7 P.M. .... ·720
Mean of the hours from 8 P.M. to 7 A.M. .... ·819

Mean of 24 hours.. ·769

In the Mean Diurnal Variation for the year a Maximum occurs at 4 A.M., and a Minimum at 1 P.M.

Extent of Cloudy Sky, 1869.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time: also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1869.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...			0·3		6·3	6·0	...	8·0	7·5	2·5	0·7
2			0·7		...	7·2	5·6	7·0	7·8	7·6	2·6	2·7
3	...		2·8	0·4		7·2	6·6	6·5	7·7	...	...	4·7
4	2·2		4·7	...	0·2	7·1	...	6·2	8·0	6·3	0·2	1·1
5	3·5	0·5	4·4	4·7	2·8	6·6	5·3	5·8	...	6·4	1·1	...
6	5·7	2·4	2·7	1·9	1·2	...	5·1	7·4	7·0	6·8	1·2	
7	4·7	...	...	0·2	3·2	5·2	5·6	6·9	4·8	5·4	...	
8		1·5	0·9		4·6	5·7	5·1	...	4·5	5·9	3·7	
9	0·3	...		2·7	...	4·4	4·2	8·0	5·2	4·9	5·2	
10	...			1·2	2·3	4·9	5·7	8·0	6·2	...	2·4	
11	0·2		0·2	...	0·5	4·4	...	7·4	6·9	2·1	1·6	
12	2·0		1·1	1·9		4·9	8·0	7·5	...	4·5	5·1	...
13	2·3	0·2	5·0	1·5	1·7	...	8·0	7·8	5·8	2·7	6·6	1·1
14	0·1	...	...	1·8	2·5	4·5	8·0	6·2	6·2		...	3·7
15	1·2	1·7	5·0	1·8	3·0	4·0	8·0	...	5·6	0·2	6·0	5·6
16	1·0		2·1	1·5	...	5·3	8·0	6·4	7·8		3·7	7·0
17	...		1·0	1·9	5·2	6·4	8·0	7·1	7·9	...	2·0	7·9
18	1·3		1·5	...	3·9	7·6	...	6·5	8·0	2·4		7·8
19			0·1	0·8	5·2	7·8	7·7	8·0	...	0·7		...
20	0·2		0·7	3·7	3·9	...	8·0	8·0	8·0	0·2		3·5
21	0·2	...	...	3·4	3·7	7·2	7·4	...	7·7	5·2	...	
22	2·1		1·1	4·4	3·7	7·9	6·7	...	7·1	3·0	1·4	0·5
23	2·4		2·2	5·9	...	7·9	8·0	7·5	6·8	1·2		3·5
24	...	0·3	3·3	6·0	...	7·9	8·0	7·5	7·5	...	0·9	1·5
25	0·9	...	2·0	...	5·1	7·2	...	7·1	8·0	1·1	2·5	...
26	3·2	5·8	...	6·7	4·8	8·0	7·6	8·0	...	2·0	0·9	...
27	1·6	0·7	2·2	2·5	6·1	...	7·2	5·2	7·9	0·5	3·6	2·2
28	1·9	...	...	1·6	5·3	8·0	6·4	6·2	7·2	2·4	...	1·7
29	0·2		1·2	1·3	6·5	7·6	6·3	...	7·6	3·7	5·0	3·0
30			0·2	0·1	...	6·3	7·0	8·0	7·4	3·5	1·3	3·6
31	...		0·2		5·2		7·2	8·0		...		5·1
Monthly Mean.	1·5	0·6	1·7	2·2	3·2	6·4	6·8	7·1	7·0	3·3	2·4	2·6
Annual Variation.	− 2·2	− 3·1	− 2·0	− 1·5	− 0·5	+ 2·7	+ 3·1	+ 3·4	+ 3·3	− 0·4	− 1·3	− 1·1

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December.........	1·8
Mean of the months from May to October	5·6
Mean for the Year	3·7
The greatest monthly mean (that of August)	7·1
The least monthly mean (that of February)	0·6
Difference............	6·5

Extent of Cloudy Sky, 1869.

TABLE XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	0·7	0·2	1·8	2·8	3·6	6·4	7·0	6·9	7·2	2·8	1·7	1·8	3·6
1 A.M.	0·9	0·7	1·7	3·3	3·4	6·0	6·9	6·8	7·1	3·0	1·4	2·0	3·6
2 „	0·8	0·7	1·5	3·1	3·4	6·2	6·9	6·8	7·0	3·0	1·4	2·0	3·6
3 „	0·7	0·7	1·4	2·5	3·7	6·4	6·6	6·7	6·5	3·3	1·5	2·7	3·6
4 „	1·1	0·9	1·2	2·4	3·4	6·4	6·7	7·2	6·6	3·1	2·0	2·4	3·6
5 „	1·5	0·7	1·7	2·6	3·9	6·3	6·6	7·4	6·8	3·4	2·0	2·1	3·7
6 „	1·8	1·0	2·9	2·9	4·0	6·5	6·6	7·6	7·1	4·6	3·0	3·0	4·2
7 „	2·1	1·2	2·7	2·7	4·3	6·6	6·9	7·6	7·2	5·1	3·4	3·1	4·4
8 „	2·0	1·1	2·1	2·7	4·4	6·5	6·7	7·2	7·3	4·7	3·3	3·4	4·3
9 „	1·9	1·0	2·2	3·0	3·7	6·7	6·6	7·1	7·2	4·1	3·2	3·2	4·2
10 „	2·3	0·9	2·3	1·8	3·1	6·6	6·9	7·0	7·1	3·7	3·0	2·7	3·9
11 „	2·2	0·8	2·3	1·2	2·8	6·5	6·9	6·8	6·9	3·4	3·0	2·8	3·8
Noon.	2·4	0·7	1·7	1·1	2·5	6·4	6·8	6·9	7·0	3·2	2·9	2·7	3·7
1 P.M.	2·3	0·4	1·7	1·1	2·4	6·5	6·8	6·7	7·0	2·9	2·8	3·0	3·6
2 „	2·4	0·4	1·8	1·2	2·5	6·3	6·8	6·8	7·2	3·0	2·5	2·9	3·6
3 „	2·1	0·2	1·9	1·2	2·4	6·3	7·1	7·2	7·4	3·2	2·5	3·0	3·7
4 „	2·3	0·4	1·7	1·4	3·0	6·5	7·1	7·1	7·3	3·2	2·6	2·8	3·8
5 „	1·6	0·5	1·5	1·8	2·5	6·7	7·3	7·4	7·0	3·2	3·0	3·4	3·8
6 „	1·3	0·5	1·7	2·2	2·5	6·6	7·4	7·8	7·2	3·1	2·8	2·7	3·8
7 „	0·9	0·3	1·5	2·1	3·0	6·9	7·1	7·7	7·0	2·8	2·0	1·9	3·6
8 „	0·7	0·2	1·2	2·5	3·0	6·2	6·9	7·5	7·0	2·7	1·9	1·7	3·5
9 „	0·5	0·2	1·1	2·7	2·5	6·2	6·9	7·0	6·6	3·0	1·8	2·0	3·4
10 „	0·7	0·2	1·1	2·7	3·1	6·3	6·4	6·9	6·9	2·7	1·8	2·2	3·4
11 „	0·6	0·3	1·0	2·9	3·1	6·4	6·6	7·0	6·9	2·4	2·0	2·2	3·4

Rainfall, 1869.

TABLE XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day, and each Month of the Year.*

1869. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
					in.	in.	in.	in.	in.	in.	in.	
1						0·05	0·00	0·35	1·84	1·70		
2						0·00	0·00	0·31	0·31	0·86		
3						0·50	0·00	0·00	0·01	0·59		
4						0·00	0·02	0·00	1·95	0·23		
5						0·06	0·01	0·00	0·04	0·01		
6						0·06	0·03	0·07	0·36	0·16		
7						0·07	0·00	0·04	0·02			
8						0·05	0·00	0·18	0·01			
9						0·00	0·00	0·30	0·01			
10						0·02	0·00	0·34	0·01			
11						0·00	0·19	0·04	0·14			
12						0·00	3·66	0·10	0·51			
13						0·00	1·43	0·20	0·54			
14						0·05	4·47	0·15	0·13			
15						0·00	1·93	0·09	0·00			
16						0·00	2·51	0·09	0·28		0·05	
17						0·00	1·57	0·67	0·22			0·07
18						1·29	2·27	0·33	1·04			0·05
19						2·41	1·27	0·82	2·20			
20						0·83	0·46	2·85	1·68			
21						0·00	0·05	0·28	1·51			
22						0·00	0·00	0·22	0·05			
23						1·14	0·91	0·01	0·14			
24						1·35	1·77	0·06	0·01			
25						1·20	0·37	0·00	0·49			
26						1·24	0·32	0·00	2·77			
27						15·31	0·39	0·00	3·09			
28						0·59	0·01	0·51	2·01			
29						0·00	0·00	1·02	0·54			
30					0·03	0·00	0·03	3·37	0·65			
31							0·22	2·84				
Monthly Total.					0·03	26·22	23·89	15·24	22·56	3·55	0·05	0·12
No. of rainy days.					1	17	22	25	29	6	1	2

Total fall of rain in the year .... 91·66 inches.
Total number of rainy days in the year 103
The greatest fall of rain in one month (June) .... 26·22 inches.

No rain fell in the months January to April, nor on any of the days left blank in the above table.

Rainfall, 1869.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
					in.	in.	in.	in.	in.	in.	in.	in.	in.
12 to 1 A.M.						0·30	0·61	0·92	0·80	0·08			2·71
1 „ 2 „						0·64	0·16	0·57	0·61	0·13			2·11
2 „ 3 „						1·37	0·68	0·59	0·60	0·32			3·56
3 „ 4 „						0·37	1·12	0·91	0·95				3·35
4 „ 5 „						0·14	1·60	0·18	1·20				3·12
5 „ 6 „						0·06	1·18	0·08	0·40				1·72
6 „ 7 „						0·01	0·65	0·47	1·16	0·01			2·30
7 „ 8 „						0·12	1·07	0·72	0·39				2·30
8 „ 9 „						0·77	0·45	1·66	0·22				3·10
9 „ 10 „						0·20	0·39	0·56	0·50				1·65
10 „ 11 „						0·03	0·04	0·24	1·79	0·17			2·27
11 „ 12 „						0·19	0·32	0·30	1·45	0·15		0·03	2·44
12 „ 1 P.M.						0·29	0·17	0·58	0·92	1·05		0·04	3·05
1 „ 2 „						0·76	0·72	0·57	0·60	0·64			3·29
2 „ 3 „						0·83	0·42	0·31	0·45	0·10			2·11
3 „ 4 „						0·19	1·33	0·33	0·31	0·11			2·27
4 „ 5 „						0·41	1·77	0·70	0·43	0·03			3·34
5 „ 6 „						0·19	0·93	0·22	0·46				1·80
6 „ 7 „						0·07	2·16	0·29	0·31	0·08			2·91
7 „ 8 „					0·03	0·17	1·32	0·36	1·00				2·88
8 „ 9 „						0·18	1·16	0·32	0·65		0·05		2·36
9 „ 10 „						1·74	1·09	1·07	0·50	0·03		0·04	4·47
10 „ 11 „						0·75	0·99	0·19	0·42	0·03		0·01	2·39
11 to 12 „						0·24	0·71	0·96	0·92	0·03			2·86

The above table includes the Rainfall on week-days only.

Rainfall, 1869.

TABLE XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 46 feet above the ground, for each Day and each Month of the Year.*

1869. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
					in.	in.	in.	in.	in.	in.	in.	in.
1						0·05	0·00	0·30	1·80	1·61		
2						0·00	0·00	0·29	0·27	0·83		
3						0·43	0·00	0·00	0·00	0·58		
4						0·00	0·02	0·00	1·84	0·21		
5						0·07	0·01	0·00	0·03	0·01		
6						0·06	0·02	0·05	0·30	0·15		
7						0·06	0·00	0·04	0·01			
8						0·05	0·00	0·17	0·01			
9						0·00	0·00	0·26	0·01			
10						0·02	0·00	0·32	0·01			
11						0·00	0·17	0·03	0·11			
12						0·00	3·49	0·09	0·41			
13						0·00	1·28	0·14	0·47			
14						0·03	4·17	0·11	0·11			
15						0·00	1·63	0·09	0·00			
16						0·00	2·10	0·09	0·24		0·05	
17						0·00	1·18	0·62	0·20			0·06
18						1·18	1·65	0·30	0·93			0·04
19						2·30	1·04	0·74	2·15			
20						0·78	0·34	2·66	1·57			
21						0·00	0·03	0·22	1·32			
22						0·00	0·00	0·17	0·04			
23						0·99	0·77	0·00	0·12			
24						1·11	1·56	0·06	0·00			
25						1·07	0·28	0·00	0·41			
26						1·16	0·26	0·00	2·54			
27						11·97	0·34	0·00	2·86			
28						0·52	0·01	0·44	1·88			
29						0·00	0·00	0·90	0·53			
30					0·02	0·00	0·03	3·05	0·59			
31							0·19	2·75				
Monthly Total.					0·02	21·85	20·57	13·89	20·76	3·39	0·05	0·10
No. of rainy days.					1	17	22	24	27	6	1	2

Total fall of rain in the year.. 80·63 in.
Total number of rainy days in the year 100
The greatest fall of rain in one month (June)................................ 21·85 in.

No rain fell in the months January to April, nor on any of the days left blank in the above table.

Rainfall, 1869.

TABLE XXI.—*Total Fall of Rain, as measured by Osler's Gauge, placed* 46 *feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
						in.	in.	in.	in.	in.	in.	in.	in.
12 to 1 A.M.						0·30	0·60	0·84	0·82	0·07			2·63
1 „ 2 „						0·56	0·15	0·49	0·51	0·13			1·84
2 „ 3 „						1·28	0·57	0·54	0·54	0·30			3·23
3 „ 4 „						0·35	0·90	0·89	0·91	0·01			3·06
4 „ 5 „						0·14	1·50	0·19	1·08				2·91
5 „ 6 „						0·05	1·10	0·09	0·37				1·61
6 „ 7 „						0·01	0·66	0·45	1·04	0·01			2·17
7 „ 8 „						0·05	0·89	0·64	0·43				2·01
8 „ 9 „						0·72	0·35	1·51	0·18				2·76
9 „ 10 „						0·20	0·34	0·52	0·40				1·46
10 „ 11 „						0·03	0·03	0·24	1·68	0·15			2·13
11 „ 12 „						0·11	0·21	0·28	1·34	0·15		0·02	2·11
12 to 1 P.M.						0·30	0·15	0·51	0·90	0·80		0·03	2·69
1 „ 2 „						0·65	0·59	0·56	0·56	0·84		0·01	3·21
2 „ 3 „						0·76	0·32	0·27	0·39	0·08			1·82
3 „ 4 „						0·15	1·15	0·27	0·26	0·10			1·93
4 „ 5 „						0·31	1·47	0·68	0·37	0·03			2·86
5 „ 6 „						0·20	0·70	0·19	0·43				1·52
6 „ 7 „						00·8	2·15	0·25	0·28	0·07			2·83
7 „ 8 „					0·02	0·20	1·22	0·26	0·94				2·64
8 „ 9 „						0·16	1·07	0·34	0·53		0·05		2·15
9 „ 10 „						1·47	0·90	0·97	0·46	0·03		0·03	3·86
10 „ 11 „						0·70	0·82	0·20	0·42	0·02		0·01	2·17
11 „ 12 „						0·26	0·61	0·86	0·79	0·02			2·54

The above Table includes the Rainfall on week-days only.

Mean Daily Velocities of the North and East Components of the Wind, 1869.

TABLE XXII.—*Showing the Mean Velocities of the North or South and East or West Components of the Winds which blew on each Day of the Year* 1869.

In miles per hour.

1869.	MONTH.																							
Date.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
1	7·4 N	1·9 W	10·9 N	2·5 W	12·2 N	6·0 W	10·1 N	6·5 W	6·4 N	6·7 W	2·1 N	3·1 W	4·6 S	18·1 W	1·5 S	9·0 W	2·0 N	12·3 W	2·8 N	11·0 W	1·0 N	1·3 W	7·9 N	4·0 W
2	6·0 N	0·5 W	12·0 N	5·1 W	10·9 N	5·7 W	5·4 N	6·1 W	0·8 N	7·7 W	6·0 S	4·2 W	6·0 S	19·4 W	4·3 S	5·9 W	1·7 S	13·3 W	3·4 N	7·2 W	3·2 N	0·8 E	...	...
3	5·0 N	0·0	7·4 N	3·9 W	4·9 N	5·6 W	2·1 N	4·4 W	3·4 N	7·0 W	16·2 S	0·0	5·8 S	23.3 W	5·0 S	2·3 W	7·2 S	7·8 W	0·7 S	6·0 W	5·7 N	0·9 E	2·0 N	0·0
4	6·4 N	0·9 W	11·2 N	1·8 W	5·0 N	4·5 W	0·6 N	3·6 W	1·0 N	7·4 W	27·7 S	18·8 E	9·4 S	22·6 W	2·4 N	5·2 W	5·8 S	5·9 W	5·9 N	13·9 W	6·7 N	0·9 E	2·7 N	0·4 E
5	7·1 N	2·9 W	10·2 N	6·3 W	7·9 N	4·3 W	4·7 N	6·9 W	2·8 S	7·0 W	34·6 S	8·3 E	8·6 S	21·9 W	7·6 N	7·6 W	7·4 S	17·2 W	1·3 N	14·2 W	6·3 N	4·6 E	7·2 N	0·5 W
6	11·1 N	2·8 W	18·1 N	6·6 W	7·4 N	7·0 W	12·5 N	8·7 W	4·1 N	6·7 W	28·7 S	7·9 W	8·3 S	21·0 W	3·9 N	9·5 W	1·7 S	17·7 W	0·4 S	14·3 W	8·5 N	4·6 E	8·2 N	3·9 E
7	11·2 N	3·3 W	6·6 N	3·3 W	10·6 N	8·3 W	10·2 N	10·1 W	6·3 N	8·2 W	14·4 S	16·7 W	8·4 S	18·4 W	0·6 N	13·7 W	4·7 S	16·0 W	3·2 S	6·5 W	6·9 N	7·4 E	9·6 N	3·4 E
8	8·7 N	1·2 E	4·3 N	1·8 W	4·7 N	2·0 W	7·7 N	8·6 W	3·4 S	8·3 W	9·1 S	19·6 W	6·5 S	12·2 W	0·0	12·5 W	0·8 N	15·4 W	5·1 S	2·2 W	6·7 N	4·3 E	8·4 N	2·3 E
9	5·9 N	0·0	9·9 N	2·0 W	0·1 N	1·5 W	5·6 N	7·9 W	2·0 S	7·5 W	8·7 S	15·1 W	1·6 S	7·4 W	1·6 S	0·8 E	1·2 N	17·2 W	1·6 S	2·0 W	8·3 N	5·5 E	7·5 N	3·5 E
10	6·2 N	2·7 W	10·2 N	1·6 W	4·1 N	2·7 W	1·5 N	6·1 W	1·3 S	8·0 W	9·9 S	12·4 W	2·4 S	5·2 W	0·4 N	2·4 W	0·6 S	17·7 W	4·3 N	3·2 W	6·1 N	2·1 E	7·1 N	2·0 E
11	7·9 N	2·5 W	4·6 N	0·9 E	0·4 S	3·8 W	10·3 S	3·8 W	7·5 N	7·6 W	8·3 S	8·2 W	4·2 S	7·2 W	4·1 N	3·0 E	5·0 S	18·1 W	8·2 N	2·8 W	4·2 N	4·0 E	7·4 N	0·3 E
12	8·6 N	2·1 W	6·6 N	3·3 W	0·3 N	4·1 W	12·9 S	2·6 W	9·4 N	7·6 W	6·6 S	9·4 W	4·3 S	4·2 W	10·5 S	8·3 E	9·5 S	17·1 W	7·6 N	1·6 W	6·6 N	0·6 E	5·9 N	2·5 E
13	10·5 N	3·5 W	9·1 N	2·1 W	3·1 N	1·2 W	6·3 S	4·6 W	6·4 N	9·3 W	8·9 S	7·5 W	3·6 S	17·7 W	12·7 S	6·3 E	14·6 S	9·1 W	8·1 N	0·7 W	9·9 N	2·1 W	3·4 N	2·4 E
14	6·0 N	0·0	5·1 S	1·0 W	4·6 N	3·8 W	7·9 S	4·8 W	2·1 N	7·6 W	13·6 S	8·1 W	0·7 S	19·2 W	6·5 S	0·9 W	12·1 S	1·5 E	7·9 N	0·6 W	5·6 N	1·4 W	6·2 N	0·5 E
15	3·8 N	0·4 E	4·2 N	2·5 W	0·2 S	3·5 W	4·8 S	3·8 W	3·6 N	9·9 W	7·3 S	7·0 W	9·7 S	27·6 W	2·4 N	1·4 W	5·9 S	0·5 E	8·6 N	2·1 W	3·7 N	0·6 E	4·2 N	0·9 E
16	5·2 N	1·9 E	9·4 N	3·9 W	2·3 N	1·2 W	1·3 S	4·7 W	5·7 N	9·7 W	2·2 S	9·6 W	18·5 S	23·4 W	0·0	6·0 W	1·4 N	1·8 W	10·8 N	3·8 W	8·8 N	1·5 E	2·2 S	0·8 E
17	4·2 N	0·4 W	8·4 N	3·3 W	10·9 N	6·2 W	0·5 N	6·9 W	3·1 N	10·1 W	1·5 S	10·6 W	13·3 S	31·1 W	1·9 S	11·4 W	1·0 N	2·7 W	8·8 N	3·0 W	10·7 N	2·9 E	2·3 S	6·1 E
18	9·0 N	1·3 W	11·5 N	5·5 W	7·8 N	6·6 W	6·8 N	9·3 W	...	...	2·9 N	12·3 W	14·2 S	27·5 W	0·4 S	21·9 W	1·8 S	2·7 W	8·5 N	4·4 W	9·6 N	8·0 E	1·4 N	1·9 E
19	9·1 N	2·0 W	12·8 N	6·7 W	10·3 N	7·5 W	6·6 N	9·1 W	...	...	2·2 N	7·6 W	15·5 S	22·8 W	2·7 S	15·3 W	2·2 S	2·8 W	6·7 N	2·1 W	8·7 N	9·9 E	2·2 N	2·2 E
20	6·9 N	0·8 W	11·6 N	6·9 W	6·7 N	7·8 W	6·4 N	7·0 W	...	...	2·2 S	2·0 W	14·1 S	22·9 W	10·2 S	6·7 W	3·5 S	4·0 W	8·2 N	1·7 W	9·0 N	5·5 E	11·1 N	4·0 W
21	6·1 N	0·6 W	11·6 N	2·3 W	1·4 N	4·4 W	8·8 N	8·8 W	4·5 N	9·4 W	5·8 S	6·7 W	15·9 S	17·0 W	13·4 S	18·1 W	13·0 S	8·5 W	7·8 N	3·2 W	6·0 N	0·5 E	11·7 N	1·9 W
22	6·7 N	1·3 W	12·7 N	4·6 W	6·5 N	5·7 W	10·4 N	8·9 W	0·8 N	9·0 W	2·5 S	10·8 W	23·0 S	11·7 W	7·2 S	19·1 W	8·8 S	12·5 W	8·9 N	1·1 W	4·3 N	1·2 W	4·2 N	1·2 W
23	2·7 N	1·0 W	10·1 N	2·8 W	10·4 N	6·6 W	10·0 N	9·6 W	3·2 S	10·7 W	9·7 S	2·7 W	18·3 S	15·5 W	7·9 S	19·1 W	4·0 S	9·7 W	7·1 N	0·2 W	4·9 N	5·1 E	2·7 S	5·0 W
24	2·5 N	0·7 W	0·3 S	1·2 W	5·3 N	9·0 W	7·3 N	9·6 W	3·2 S	8·7 W	14·2 S	0·8 E	2·8 S	20·5 W	4·1 S	17·9 W	4·2 S	12·0 W	5·0 N	1·4 W	8·1 N	4·8 E	0·4 S	1·8 W
25	1·1 N	2·3 E	2·7 N	2·0 W	9·9 N	6·5 W	7·3 N	8·2 W	5·0 S	9·3 W	13·5 S	2·3 E	9·7 S	19·2 W	0·0	14·0 W	11·6 S	13·7 W	6·4 N	1·2 W	8·9 N	0·6 E	11·3 N	1·5 W
26	0·1 S	1·3 E	6·9 N	0·8 W	7·2 N	4·6 W	3·5 N	6·1 W	2·5 S	8·4 W	7·2 S	5·4 W	13·3 S	16·3 W	0·6 N	13·1 W	6·0 S	14·6 W	4·8 N	1·5 W	7·8 N	1·5 E	6·4 N	2·3 W
27	2·1 N	2·1 E	0·7 N	1·5 W	7·2 N	7·6 W	0·3 S	7·4 W	0·2 N	8·2 W	6·8 S	16·9 W	12·4 S	14·7 W	2·6 S	11·6 W	1·6 S	16·4 W	5·1 N	0·3 E	7·0 N	1·3 E	9·0 N	3·4 W
28	7·6 N	2·1 W	9·9 N	3·6 W	8·1 N	6·1 W	0·3 S	4·9 W	5·3 N	8·7 W	6·1 S	20·9 W	4·5 S	15·0 W	1·9 N	14·3 W	4·9 S	2·3 W	5·9 N	2·1 W	0·5 N	2·6 E	10·2 N	3·1 W
29	8·6 N	3·3 W			10·9 N	7·6 W	5·8 N	6·9 W	2·5 S	6·9 W	8·7 S	21·0 W	1·0 S	12·9 W	3·6 N	12·6 W	3·9 S	2·3 W	8·2 N	3·5 W	1·3 N	0·8 W	8·3 N	2·2 W
30	4·9 N	3·1 W			11·0 N	7·0 W	...	...	1·3 S	5·3 W	8·4 S	20·3 W	0·0	12·8 W	1·1 N	15·5 W	0·6 S	6·2 W	3·1 N	0·7 E	4·3 N	2·1 W	5·8 N	0·8 W
31	8·7 N	2·7 W			11·6 N	8·2 W			1·2 N	2·8 W			1·1 S	13·8 W	0·1 N	8·7 W			0·7 N	1·6 E			8·7 N	1·6 W
Monthly Mean. ...	6·3 N	1·1 W	8·1 N	3·2 W	6·6 N	5·4 W	3·1 N	6·7 W	1·6 N	8·0 W	9·5 S	7·9 W	8·5 S	17·5 W	2·1 S	9·0 W	4·5 S	9·8 W	5·0 N	3·7 W	6·3 N	2·4 E	5·7 N	0·0
Annual Variation....	4·8 N	4·7 E	6·6 N	2·6 E	5·1 N	0·4 E	1·6 N	0·9 W	0·1 N	2·2 W	11·0 S	2·1 W	10·0 S	11·7 W	3·6 S	3·2 W	6·0 S	4·0 W	3·5 N	2·1 E	4·8 N	8·2 E	4·2 N	5·8 E

The Velocities of the Mean Components for the year are 1·5 N. and 5·8 W.

Diurnal Variation of the Velocity of the North and East Components of the Wind, 1869.

TABLE XXIII.—*Showing the Excess of the Mean Velocities of the North or South and East or West Components of the Winds which blew at each Hour of the Day, above the respective Mean Velocities for the whole Day, in each Month of the Year* 1869.

In miles per hour.

1869. Bombay Civil Time.	MONTH. January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Year.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
12 to 1 A.M.	1·4 S	2·1 E	2·1 S	2·6 E	1·3 S	2·2 E	1·3 N	0·7 E	0·4 N	3·4 E	0·7 S	1·5 E	0·1 N	0·5 W	0·0	0·6 E	0·5 N	1·2 E	2·0 S	1·9 E	2·2 S	1·9 E	2·6 S	2·3 E	0·8 S	1·7 E
1 „ 2 „	1·7 S	3·1 E	2·3 S	3·0 E	1·2 S	2·5 E	1·5 N	2·9 E	0·4 S	3·0 E	0·2 N	2·5 E	0·2 N	1·0 W	0·1 S	0·6 E	0·0	1·7 E	2·1 S	2·2 E	1·8 S	2·5 E	2·4 S	3·3 E	0·8 S	2·2 E
2 „ 3 „	1·7 S	3·1 E	1·6 S	2·5 E	1·2 S	3·6 E	1·0 N	3·8 E	0·3 S	3·9 E	1·0 S	3·1 E	0·3 S	0·6 W	0·9 S	1·0 E	0·3 N	1·4 E	1·7 S	2·2 E	1·0 S	2·8 E	2·3 S	3·3 E	0·9 S	2·5 E
3 „ 4 „	1·2 S	3·7 E	1·6 S	2·2 E	1·0 S	4·4 E	0·4 S	5·5 E	0·1 S	4·1 E	1·1 S	2·3 E	1·2 S	0·9 W	1·0 S	0·9 E	0·5 N	1·4 E	2·1 S	3·4 E	0·9 S	4·0 E	1·7 S	4·7 E	1·0 S	3·0 E
4 „ 5 „	0·6 S	4·5 E	1·2 S	3·5 E	1·0 S	5·0 E	1·6 S	7·3 E	0·6 S	4·9 E	0·4 S	3·2 E	0·4 N	0·5 W	1·3 S	3·4 E	0·4 S	1·9 E	1·9 S	3·8 E	0·0	4·4 E	1·9 S	5·3 E	0·9 S	3·9 E
5 „ 6 „	0·4 S	5·6 E	2·2 S	5·6 E	1·2 S	6·8 E	2·2 S	8·1 E	1·5 S	5·7 E	0·1 S	3·9 E	0·5 N	0·8 W	1·2 S	3·1 E	1·1 S	3·3 E	1·8 S	4·0 E	0·8 N	5·0 E	2·0 S	6·2 E	1·0 S	4·7 E
6 „ 7 „	1·5 S	6·5 E	3·2 S	7·2 E	1·8 S	7·7 E	2·4 S	8·7 E	1·3 S	6·0 E	1·2 N	5·0 E	0·6 N	0·5 E	1·0 S	3·5 E	2·4 S	4·0 E	2·1 S	4·8 E	0·4 N	5·8 E	1·6 S	6·0 E	1·3 S	5·5 E
7 „ 8 „	1·3 S	7·2 E	3·4 S	7·6 E	1·5 S	9·5 E	2·1 S	8·7 E	1·5 S	5·3 E	0·0	5·3 E	0·4 N	0·6 E	1·3 S	4·1 E	1·0 S	3·3 E	1·7 S	5·6 E	0·1 S	6·2 E	1·8 S	6·5 E	1·3 S	5·8 E
8 „ 9 „	2·3 S	7·1 E	3·2 S	7·4 E	1·5 S	8·4 E	2·3 S	6·8 E	2·2 S	4·3 E	0·1 S	4·2 E	0·6 N	1·0 E	0·8 S	3·8 E	0·3 S	2·0 E	1·8 S	6·0 E	0·0	6·6 E	1·7 S	6·6 E	1·3 S	5·3 E
9 „ 10 „	2·4 S	6·5 E	3·2 S	7·5 E	0·8 S	6·2 E	2·6 S	3·5 E	2·5 S	2·2 E	0·2 N	2·8 E	0·0	1·1 E	2·6 S	3·9 E	0·5 S	0·6 E	1·5 S	5·3 E	1·2 S	6·2 E	1·9 S	5·0 E	1·6 S	4·2 E
10 „ 11 „	2·2 S	4·9 E	4·0 S	4·0 E	0·1 S	0·7 E	2·7 S	1·2 W	1·6 S	0·4 W	0·0	1·2 W	0·6 N	0·1 W	2·4 S	1·7 E	1·6 S	0·7 E	2·7 S	3·3 E	1·7 S	4·6 E	2·3 S	3·4 E	1·7 S	1·7 E
11 „ 12 „	3·2 S	0·7 E	2·3 S	2·1 W	0·2 S	2·6 W	1·0 S	3·8 W	1·0 S	2·7 W	0·9 S	1·8 W	0·4 S	0·5 W	2·9 S	0·7 E	0·2 S	0·8 W	1·1 S	1·5 W	1·3 S	2·3 E	2·0 S	0·5 E	1·4 S	1·0 W
12 to 1 P.M.	2·1 S	3·7 W	0·6 S	5·9 W	0·5 N	6·5 W	0·1 S	6·7 W	0·2 S	5·2 W	0·2 S	2·9 W	0·2 S	0·1 W	1·4 S	2·8 W	1·1 S	1·7 W	0·4 N	5·8 W	1·6 S	0·9 W	0·9 S	2·5 W	0·6 S	3·7 W
1 „ 2 „	1·5 S	6·3 W	0·6 N	8·0 W	1·3 N	7·5 W	1·1 N	7·7 W	0·3 N	6·4 W	1·0 S	3·2 W	0·7 S	0·6 E	0·2 N	2·9 W	2·6 S	1·9 W	1·4 N	6·2 W	1·4 S	3·6 W	0·2 S	5·0 W	0·2 S	4·8 W
2 „ 3 „	0·1 S	8·5 W	2·8 N	9·6 W	2·7 N	8·2 W	2·2 N	9·5 W	0·8 N	7·2 W	0·3 S	4·8 W	1·0 S	0·4 E	0·7 N	3·7 W	0·5 S	3·0 W	2·7 N	7·8 W	0·4 S	6·4 W	1·0 N	7·8 W	0·9 N	6·3 W
3 „ 4 „	1·8 N	8·4 W	3·8 N	9·2 W	2·7 N	8·9 W	2·9 N	8·1 W	1·0 N	7·7 W	0·4 N	4·8 W	0·5 N	0·4 E	1·7 N	3·9 W	0·8 N	3·1 W	2·9 N	7·0 W	0·5 N	9·5 W	1·9 N	7·5 W	1·7 N	6·5 W
4 „ 5 „	3·7 N	7·7 W	6·0 N	7·7 W	3·1 N	8·7 W	3·6 N	8·3 W	1·8 N	8·4 W	0·0	4·6 W	0·0	1·7 W	3·3 N	3·7 W	1·0 N	2·9 W	4·3 N	5·8 W	2·5 N	9·5 W	4·0 N	7·6 W	2·8 N	6·4 W
5 „ 6 „	4·0 N	7·0 W	6·1 N	6·4 W	2·9 N	6·9 W	2·9 N	6·0 W	2·2 N	6·0 W	1·1 N	4·9 W	0·0	0·2 E	3·0 N	3·6 W	0·8 N	3·6 W	3·4 N	4·3 W	3·8 N	8·6 W	4·6 N	6·8 W	2·9 N	5·3 W
6 „ 7 „	4·5 N	5·2 W	5·4 N	4·3 W	1·7 N	4·9 W	1·3 N	3·5 W	2·5 N	4·1 W	0·5 N	2·9 W	0·2 S	0·0	2·9 N	4·2 W	1·8 N	1·3 W	3·3 N	2·9 W	3·6 N	5·9 W	5·0 N	5·9 W	2·7 N	3·8 W
7 „ 8 „	4·9 N	4·9 W	4·8 N	3·3 W	1·0 N	3·4 W	0·4 N	1·4 W	2·0 N	1·6 W	0·1 N	1·3 W	0·1 N	0·7 E	1·9 N	2·3 W	1·8 N	1·4 W	3·1 N	2·2 W	3·6 N	5·1 W	4·9 N	5·3 W	2·4 N	2·6 W
8 „ 9 „	3·8 N	2·7 W	3·1 N	1·8 W	0·4 N	2·1 W	0·7 S	0·6 W	1·3 N	0·5 E	1·3 N	1·2 W	0·7 N	0·6 E	1·4 N	0·6 W	1·2 N	0·9 W	2·2 N	1·6 W	2·2 N	3·3 W	3·8 N	4·1 W	1·7 N	1·5 W
9 „ 10 „	1·7 N	1·0 W	1·1 N	0·3 E	0·3 S	0·3 W	0·8 S	0·1 E	0·8 N	0·8 E	1·4 N	0·3 W	0·6 N	0·2 W	1·5 N	0·1 W	0·2 N	1·7 W	0·9 N	0·5 W	0·3 N	1·5 W	1·6 N	2·1 W	0·7 N	0·5 W
10 „ 11 „	0·5 N	0·2 W	0·8 S	2·6 E	1·2 S	1·2 E	0·3 S	0·4 W	0·2 N	2·6 E	0·6 N	0·4 E	0·2 S	0·1 E	0·7 N	0·6 E	0·8 N	0·5 W	0·8 S	0·4 E	1·4 S	0·0	0·3 S	0·4 W	0·2 S	0·5 E
11 „ 12 „	0·2 S	1·0 E	1·5 S	2·9 E	1·5 S	2·0 E	0·6 N	0·1 W	0·3 S	3·4 E	0·4 S	0·4 E	0·0	0·4 E	0·6 N	0·9 E	0·7 N	0·6 E	2·2 S	1·6 E	2·2 S	1·7 E	1·6 S	1·7 E	0·7 S	1·4 E

Velocity of Wind, 1869.

TABLE XXIV.—*Mean Velocity of the Wind, in miles per hour, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Mean Monthly Velocity and its Variation from the Mean of the Year.*

1869. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1	8·6	12·0	14·3	13·2	11·3	8·6	19·0	9·9	12·8	11·7	7·0	9·4
2	7·9	13·7	13·1	10·9	10·0	11·8	20·6	8·9	13·8	8·9	7·5	...
3	7·3	10·3	8·9	6·9	8·3	19·2	24·4	9·6	12·1	10·9	9·0	4·8
4	8·9	13·2	7·7	7·7	8·5	36·1	24·5	9·4	10·6	15·2	9·2	6·2
5	8·8	12·8	11·3	8·6	10·1	38·5	23·6	11·5	19·1	14·5	10·2	9·1
6	12·2	20·0	10·9	15·7	12·5	31·1	22·6	10·8	18·0	14·7	11·7	12·3
7	11·9	10·0	13·7	15·9	11·3	22·3	20·3	14·9	17·0	8·3	11·0	13·6
8	10·8	8·2	8·5	12·8	13·1	21·8	14·0	14·6	15·9	7·6	10·4	13·2
9	8·5	13·6	7·1	10·4	9·0	17·7	7·7	8·2	17·5	7·3	10·8	13·0
10	8·5	11·8	8·0	8·7	10·5	16·5	7·7	7·7	17·8	8·1	9·5	8·9
11	9·3	9·2	6·4	13·1	12·0	12·0	10·0	8·9	19·2	10·0	10·8	10·2
12	10·3	9·1	6·1	14·7	14·2	11·7	9·6	15·4	20·2	9·0	9·0	9·2
13	11·7	11·9	7·9	11·0	11·7	12·5	18·7	18·0	18·7	9·5	10·6	8·2
14	8·6	8·2	8·8	12·0	9·5	17·0	20·0	11·4	14·0	9·7	7·3	9·9
15	8·2	11·4	6·9	9·3	10·9	11·0	29·7	8·4	9·3	10·2	6·2	6·0
16	10·1	11·2	10·1	7·0	11·6	10·1	30·3	9·1	5·2	12·5	11·8	7·0
17	8·3	10·1	13·9	8·1	11·2	10·5	34·1	13·1	5·0	10·6	12·7	7·4
18	10·4	13·4	11·7	11·9	...	13·1	31·6	22·0	10·2	10·4	12·9	7·9
19	10·6	15·7	14·5	12·8	...	12·0	29·0	16·1	8·7	9·0	15·2	8·1
20	9·5	14·3	11·9	13·0	...	10·4	27·4	18·4	9·2	10·5	13·8	12·4
21	7·9	14·4	8·5	13·1	11·1	10·6	23·5	23·0	18·9	9·2	9·0	12·6
22	9·1	14·6	10·6	13·7	9·4	11·3	26·3	21·5	15·8	10·4	7·1	6·1
23	7·5	11·0	13·6	14·2	11·4	13·9	24·7	20·7	10·7	9·4	11·8	8·0
24	5·2	6·6	10·9	13·7	9·4	21·3	21·9	18·7	12·8	8·5	11·8	6·5
25	6·9	7·9	12·7	11·7	10·9	17·5	21·8	14·0	18·8	9·2	11·2	13·1
26	6·6	9·3	10·2	8·3	9·7	13·6	21·3	13·3	17·8	6·8	9·3	8·2
27	9·5	6·1	11·0	8·6	9·1	21·9	19·5	12·1	17·1	7·8	12·0	10·8
28	11·1	11·9	10·6	8·4	10·9	22·1	16·0	15·2	11·4	7·7	7·5	11·1
29	11·0		14·7	11·2	8·3	22·8	13·5	13·7	10·0	10·5	5·2	9·5
30	7·6		14·1	...	11·8	22·0	13·0	16·0	11·5	7·2	8·7	9·9
31	13·0		15·4		11·2		14·0	9·8		8·2		10·0
Monthly Mean.	9·2	11·5	10·8	11·3	10·7	17·4	20·7	13·7	14·0	9·8	10·0	9·4
Annual Variation.	− 3·2	− 0·9	− 1·6	− 1·1	− 1·7	+ 5·0	+ 8·3	+ 1·3	+ 1·6	− 2·6	− 2·4	− 3·0

	Miles.
The Mean Velocity for June to August	17·3
The Mean Velocity for September to May	10·7
The Mean Velocity for the Year	12·4
The greatest monthly mean (that of July)	20·7
The least monthly mean (that of January)	9·2
Difference...........	11·5

Velocity of Wind, 1869.

TABLE XXV.—*The Mean Diurnal Variation of the Velocity of the Wind, in miles per hour, for each Month and for the whole Year; or the Excess of the Mean Hourly Velocity above the respective Monthly and Annual Means.*

1869. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
12 to 1 A.M.	− 3·1	− 3·2	− 4·2	− 0·6	− 2·8	− 0·2	+ 0·1	− 1·1	− 1·4	− 2·3	− 2·2	− 3·4	− 2·0
1 „ 2 „	− 2·5	− 3·3	− 3·8	− 2·2	− 2·6	− 0·2	+ 0·6	− 0·9	0·0	− 2·7	− 2·1	− 2·7	− 1·9
2 „ 3 „	− 2·7	− 3·4	− 3·4	− 3·1	− 2·7	0·0	+ 0·4	− 0·8	− 0·3	− 2·4	− 1·5	− 2·2	− 1·8
3 „ 4 „	− 1·8	− 3·3	− 3·0	− 3·6	− 3·1	− 0·4	+ 0·9	− 0·1	− 0·1	− 1·5	− 0·4	− 1·2	− 1·5
4 „ 5 „	− 1·4	− 2·2	− 2·7	− 5·6	− 3·4	− 1·7	+ 0·1	+ 0·2	+ 0·5	− 1·2	+ 0·2	− 0·8	− 1·5
5 „ 6 „	− 1·0	− 2·5	− 2·5	− 4·6	− 3·9	− 1·6	+ 0·1	− 0·6	+ 0·1	− 1·6	+ 0·9	− 0·3	− 1·5
6 „ 7 „	− 0·5	− 2·7	− 2·9	− 4·4	− 4·6	− 1·6	− 0·9	− 1·2	− 0·2	− 2·0	+ 1·2	− 0·5	− 1·7
7 „ 8 „	− 0·4	− 3·3	− 1·9	− 4·4	− 3·6	− 1·1	− 0·7	− 0·6	− 0·2	− 1·0	+ 1·3	− 0·2	− 1·3
8 „ 9 „	− 0·9	− 3·4	− 2·2	− 4·3	− 2·6	− 0·5	− 0·8	− 0·1	− 0·8	− 0·9	+ 1·7	0·0	− 1·2
9 „ 10 „	− 1·2	− 3·3	− 1·7	− 3·3	− 1·8	− 0·6	− 0·9	− 0·7	− 0·3	− 0·9	+ 0·8	− 1·7	− 1·3
10 „ 11 „	− 1·6	− 3·7	− 1·2	− 1·0	− 1·0	+ 0·1	− 0·6	+ 0·2	− 0·6	− 2·3	− 0·7	− 2·5	− 1·2
11 „ 12 „	− 3·3	− 2·5	+ 0·3	+ 1·4	+ 0·8	+ 0·4	+ 0·3	+ 0·3	− 0·1	− 1·4	− 1·1	− 2·5	− 0·6
12 „ 1 P.M.	− 1·4	+ 1·1	+ 3·6	+ 4·1	+ 3·3	+ 0·8	+ 0·1	+ 1·4	+ 0·5	+ 1·8	− 1·4	− 0·8	+ 1·1
1 „ 2 „	+ 0·5	+ 3·3	+ 4·9	+ 5·7	+ 4·5	+ 2·0	0·0	+ 1·3	+ 1·5	+ 2·7	− 0·7	+ 0·6	+ 2·2
2 „ 3 „	+ 3·1	+ 5·9	+ 6·1	+ 7·3	+ 5·5	+ 2·7	+ 0·6	+ 1·8	+ 1·3	+ 4·9	+ 0·4	+ 2·6	+ 3·5
3 „ 4 „	+ 4·1	+ 6·8	+ 6·7	+ 6·5	+ 6·0	+ 1·3	+ 0·1	+ 1·1	+ 1·0	+ 4·3	+ 1·5	+ 3·4	+ 3·6
4 „ 5 „	+ 5·0	+ 7·5	+ 6·8	+ 6·6	+ 6·8	+ 1·7	+ 2·1	+ 1·8	+ 1·3	+ 4·4	+ 2·7	+ 4·6	+ 4·3
5 „ 6 „	+ 4·7	+ 6·3	+ 5·3	+ 4·3	+ 4·9	+ 1·4	+ 0·3	+ 1·0	+ 1·2	+ 2·8	+ 2·3	+ 4·2	+ 3·2
6 „ 7 „	+ 3·8	+ 4·8	+ 2·9	+ 1·4	+ 3·3	− 0·3	− 0·5	+ 1·4	− 0·3	+ 1·7	+ 1·7	+ 3·7	+ 2·0
7 „ 8 „	+ 3·9	+ 3·8	+ 1·5	− 0·2	+ 1·5	− 0·1	− 0·7	− 0·3	− 0·2	+ 1·1	+ 1·5	+ 3·2	+ 1·2
8 „ 9 „	+ 2·0	+ 2·0	+ 0·1	− 0·9	− 0·4	− 0·6	− 0·8	− 1·3	− 0·8	+ 0·2	− 0·2	+ 1·8	+ 0·1
9 „ 10 „	− 0·5	− 0·1	− 1·7	− 0·4	− 0·3	− 0·8	+ 0·5	− 0·7	− 0·3	− 0·9	− 1·2	− 0·3	− 0·6
10 „ 11 „	− 1·7	− 1·8	− 3·4	+ 0·7	− 1·6	− 0·9	− 0·2	− 1·0	− 1·7	− 1·7	− 2·2	− 1·9	− 1·4
11 „ 12 „	− 2·4	− 3·0	− 4·0	0·0	− 3·0	− 0·3	− 0·9	− 1·0	− 0·8	− 1·7	− 2·2	− 2·5	− 1·8

	Miles.
The Mean Velocity of the Wind for the hours from 10 P.M. to 10 A.M.	10·8
The Mean Velocity of the Wind for the hours from 10 A.M. to 10 P.M.	14·0
The Mean Velocity for 24 hours	12·4

In the Mean Diurnal Variation for the year a Maximum occurs about 4 P.M., and a Minimum about 1 A.M.

Aggregate and Mean Velocities and Relative Frequency of Different Winds, 1869.

TABLE XXVI.—*Showing, for the year* 1869, *the Sums of the Velocities, and the Mean Velocities, in miles per hour, of the Winds which blew in each Month, from each of the Sixteen Principal Directions: and also the number of Observations which those sums comprise; the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.*

1869.	N.			NNE.			NE.			ENE.			E.			ESE.			SE.			SSE.		
Months.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January......	864	116	7·4	545	87	6·3	681	80	8·5	403	50	8·1	192	28	6·9	261	34	7·7						
February ...	1138	127	9·0	425	57	7·5	319	40	8·0	175	21	8·3	137	21	6·5	118	21	5·6	80	14	5·7	84	10	8·4
March	451	63	7·2	324	46	7·0	184	22	8·4	140	19	7·4	63	9	7·0	261	35	7·5	24	4	6·0	7	1	7·0
April	198	34	5·8	152	28	5·4	35	4	8·7	22	4	5·5	34	6	5·7	126	15	8·4	127	15	8·5	129	13	9·9
May	133	22	6·0	88	17	5·2	13	1	13·0	11	1	11·0	32	5	6·4	77	8	9·6	40	4	10·0	44	5	8·8
June							46	4	11·5	90	8	11·2	84	7	12·0	98	9	10·9	1109	50	22·2	930	30	31·0
July	4	1	4·0													7	1	7·0	41	5	8·2	27	2	13·5
August	37	7	5·3	28	5	5·6	61	7	8·7	144	18	8·0	63	7	9·0	389	32	12·2	433	33	13·1	352	25	14·1
September ...	18	1	18·0	26	4	6·5	41	6	6·8	12	3	4·0	57	9	6·3	95	11	8·6	297	25	11·9	404	29	13·9
October	712	103	6·9	254	39	6·5	712	98	7·3	193	28	6·9	107	17	6·3	108	10	10·8	18	2	9·0	95	10	9·5
November ...	465	70	6·6	696	87	8·0	2145	186	11·5	729	62	11·8	426	48	8·9	259	30	8·6	38	3	12·7	6	1	6·0
December ...	787	104	7·6	325	52	6·2	871	94	9·3	729	85	8·6	321	46	7·0	187	25	7·5	107	12	8·9	53	7	7·6
Year......	4807	648	7·4	2863	422	6·8	5108	542	9·4	2648	299	8·9	1516	203	7·5	1986	231	8·6	2314	167	13·9	2131	133	16·0

[*Continued.*

1869	S.			SSW.			SW.			WSW.			W.			WNW.			NW.			NNW.		
Months.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January	6	1	6·0				3	1	3·0	74	14	5·3	130	17	7·6	529	59	9·0	1262	98	12·9	1879	151	12·4
February ...	35	4	8·7	49	9	5·4	14	3	4·7	114	12	9·5	62	8	7·7	351	30	11·7	2139	137	15·6	2454	152	16·1
March	6	1	6·0				26	6	4·3	21	3	7·0	297	41	7·2	1656	142	11·7	3328	234	14·2	1189	105	11·3
April	330	21	15·7	315	34	9·3	254	29	8·8	552	52	10·6	646	65	9·9	1893	149	12·7	2245	148	15·2	764	70	10·9
May	150	11	13·6	234	21	11·1	311	42	7·4	985	100	9·8	1547	135	11·5	1962	158	12·4	1239	111	11·2	302	30	10·1
June	1413	51	27·7	1219	69	17·7	1706	117	14·6	4249	245	17·3	986	75	13·1	440	37	11·9	81	8	10·1	16	4	4·0
July	93	7	13·3	833	35	23·8	3245	141	23·0	8387	375	22·4	2361	154	15·3	366	21	17·4				6	1	6·0
August	200	14	14·3	188	13	14·5	656	36	18·2	2406	166	14·5	3528	238	14·8	1100	86	12·8	514	48	10·7	69	6	11·5
September ...	311	23	13·5	687	44	15·6	1290	84	15·4	3215	208	15·5	2800	183	15·3	668	69	9·7	49	6	8·2	79	13	6·1
October	47	4	11·7	78	8	9·7	69	9	7·7	293	34	8·6	770	60	12·8	1081	100	10·8	1604	126	12·7	1124	93	12·1
November ...	16	4	4·0										89	11	8·1	402	42	9·6	764	71	10·8	1156	99	11·7
December ...	32	5	6·4	19	3	6·3	35	5	7·0	128	13	9·8	136	18	7·5	299	37	8·1	1052	84	12·5	1698	129	13·2
Year......	2639	146	18·1	3622	236	15·3	7609	473	16·1	20424	1222	16·7	13352	1005	13·3	10747	930	11·6	14277	1071	13·3	10736	853	12·6

Barometric Pressure, 1870.

TABLE I.—*Mean Height of Standard Barometer (No. 58), Corrected for Temperature, for each Day of Bombay Civil Time: also the Mean Monthly Height and its Variation from the Mean of the Year.*

Cistern of Barometer 37 feet above the mean sea-level.

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	29·879	29·896	29·735	...	29·621	29·678	29·705	29·708	29·845	29·863	29·965
2	...	·876	·842	·759	29·811	·675	·676	·708	·791	...	·828	·960
3	29·859	·855	·804	...	·834	·702	...	·652	·828	·821	·815	·989
4	·838	·854	·836	·822	·824	·713	·672	·648	...	·843	·801	...
5	·868	·850	·849	·826	·804	...	·679	·662	·776	·828	·780	30·013
6	·918	...	...	·785	·771	·735	·662	·688	·788	·812	...	·013
7	·897	·819	·824	·741	·778	·765	·637	...	·823	·818	·799	·012
8	·866	·833	·844	·820	...	·684	·616	·747	·830	·845	·875	·015
9	...	·844	·828	·818	·716	·609	·656	·734	·820	...	·937	·006
10	·871	·845	·828	...	·725	·670	...	·700	·828	·836	·927	29·995
11	·876	·841	·840	·779	·733	·717	·668	...	...	·865	·888	...
12	·858	·895	·838	·793	·753	...	·638	·744	·840	·847	·887	·938
13	·838	...	...	·775	·766	·634	·638	·725	·810	·836	...	·919
14	·844	·872	·792	·781	·748	·609	·621	...	·768	·812	·886	·936
15	·861	·888	·788	...	...	·541	·612	·693	·736	·800	·881	·952
16	...	·893	·810	·734	·750	·482	·595	·746	·673	...	·917	·949
17	·881	·876	...	...	·791	·494	...	·731	·629	·788	·926	·919
18	·875	·892	·874	·774	·785	·478	·615	·730	...	·787	·921	...
19	·855	·919	·872	·785	·782	...	·664	·748	·592	·787	·929	·915
20	·867	...	...	·842	·774	·517	·653	·760	·557	·783	...	·911
21	·901	·953	·871	·847	·770	·573	·642	...	·549	·749	·998	·836
22	·897	·923	·876	·828	...	·643	·636	·747	·647	·680	·939	·846
23	...	·908	·906	·837	·773	·723	·695	·765	·749	...	·886	·908
24	·876	·885	·923	...	...	·765	...	·760	·804	·635	·937	·939
25	·894	·877	·879	·802	·753	·746	·658	·758	...	·665	·964	...
26	·905	·888	·840	·836	·767	...	·635	·737	·812	...	·971	·876
27	·907	...	...	·842	·761	·735	·579	·737	·806	·820	...	·866
28	·902	...	·805	·796	·768	·701	·562	...	·810	·879	·954	·910
29	·940		·762	·754	...	·689	·584	·760	·812	·899	·942	·916
30	...		·756	·754	·709	·694	·601	·732	·825	...	·944	·883
31	·889		·762		·646		...	·701		·888		·879
Monthly Mean.	29·879	29·877	29·836	29·795	29·764	29·651	29·637	29·724	29·754	29·807	29·900	29·936
Annual Variation.	+0·082	+0·080	+0·039	−0·002	−0·033	−0·146	−0·160	−0·073	−0·043	+0·010	+0·103	+0·139

	in.
Mean of the months from January to March and October to December	29·872
Mean of the months from April to September	29·721
Mean for the Year	29·797
The greatest monthly mean (that of December)	29·936
The least monthly mean (that of July)	29·637
Difference......	0·299

Barometric Pressure, 1870.

TABLE II.—*The Mean Diurnal Variation of the Height of Barometer for each Month, and for the whole Year; or the Excess of the Mean Hourly Height above the respective Monthly and Annual Means.*

1870.	MONTH.												Year.
Bombay Civil Time.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·005	+0·002	+0·003	+0·002	0·000	+0·011	+0·010	+0·007	+0·001	+0·002	−0·001	+0·003	+0·004
1 A.M.	− ·005	− ·010	− ·010	− ·010	− ·014	− ·003	− ·007	− ·007	− ·013	− ·011	− ·013	− ·010	− ·009
2 „	− ·017	− ·024	− ·023	− ·023	− ·027	− ·018	− ·021	− ·022	− ·025	− ·022	− ·024	− ·021	− ·022
3 „	− ·027	− ·032	− ·029	− ·031	− ·032	− ·027	− ·029	− ·030	− ·034	− ·025	− ·029	− ·030	− ·030
4 „	− ·025	− ·030	− ·021	− ·026	− ·027	− ·022	− ·028	− ·026	− ·031	− ·022	− ·027	− ·025	− ·026
5 „	− ·016	− ·020	− ·009	− ·012	− ·015	− ·013	− ·019	− ·016	− ·020	− ·011	− ·015	− ·015	− ·015
6 „	·000	− ·001	+ ·010	+ ·008	+ ·005	+ ·004	− ·005	− ·002	− ·002	+ ·009	+ ·006	+ ·001	+ ·003
7 „	+ ·022	+ ·025	+ ·033	+ ·033	+ ·030	+ ·020	+ ·010	+ ·014	+ ·020	+ ·031	+ ·030	+ ·026	+ ·024
8 „	+ ·047	+ ·050	+ ·053	+ ·057	+ ·046	+ ·034	+ ·025	+ ·031	+ ·040	+ ·050	+ ·053	+ ·051	+ ·045
9 „	+ ·068	+ ·068	+ ·066	+ ·067	+ ·054	+ ·041	+ ·034	+ ·040	+ ·050	+ ·063	+ ·066	+ ·067	+ ·057
10 „	+ ·064	+ ·071	+ ·067	+ ·061	+ ·053	+ ·040	+ ·036	+ ·040	+ ·049	+ ·059	+ ·060	+ ·064	+ ·055
11 „	+ ·047	+ ·053	+ ·052	+ ·050	+ ·046	+ ·029	+ ·030	+ ·034	+ ·040	+ ·038	+ ·038	+ ·045	+ ·042
Noon.	+ ·019	+ ·024	+ ·025	+ ·027	+ ·030	+ ·017	+ ·020	+ ·020	+ ·019	+ ·008	+ ·008	+ ·014	+ ·019
1 P.M.	− ·013	− ·007	− ·002	+ ·001	+ ·008	·000	+ ·006	+ ·002	− ·004	− ·020	− ·020	− ·019	− ·006
2 „	− ·040	− ·033	− ·029	− ·026	− ·014	− ·019	− ·009	− ·015	− ·028	− ·046	− ·041	− ·040	− ·028
3 „	− ·053	− ·050	− ·046	− ·046	− ·032	− ·039	− ·023	− ·030	− ·042	− ·060	− ·051	− ·053	− ·044
4 „	− ·053	− ·053	− ·052	− ·057	− ·045	− ·048	− ·032	− ·037	− ·044	− ·057	− ·051	− ·054	− ·049
5 „	− ·045	− ·048	− ·050	− ·057	− ·045	− ·046	− ·031	− ·034	− ·036	− ·041	− ·039	− ·045	− ·044
6 „	− ·030	− ·034	− ·039	− ·042	− ·033	− ·035	− ·021	− ·023	− ·023	− ·024	− ·025	− ·029	− ·030
7 „	− ·012	− ·016	− ·025	− ·025	− ·018	− ·015	− ·008	− ·010	− ·006	− ·002	− ·002	− ·006	− ·012
8 „	+ ·008	+ ·005	− ·005	− ·005	− ·004	+ ·005	+ ·006	+ ·004	+ ·013	+ ·018	+ ·017	+ ·013	+ ·006
9 „	+ ·024	+ ·019	+ ·011	+ ·011	+ ·006	+ ·021	+ ·018	+ ·016	+ ·028	+ ·026	+ ·025	+ ·025	+ ·019
10 „	+ ·024	+ ·021	+ ·017	+ ·019	+ ·012	+ ·030	+ ·025	+ ·022	+ ·030	+ ·022	+ ·022	+ ·022	+ ·022
11 „	+ ·016	+ ·013	+ ·010	+ ·013	+ ·010	+ ·027	+ ·022	+ ·016	+ ·022	+ ·012	+ ·012	+ ·013	+ ·015

In the Mean Diurnal Variation for the year—

A Minimum occurs....................at 3 A.M.
A Maximum ....at 9 A.M.
A Minimum ....at 4 P.M.
And a Maximum ....at 10 P.M.

Temperature of the Air, 1870.

TABLE III.—*Mean Daily Temperature of the Air for each Day of Bombay Civil Time: also the Mean Monthly Temperature, and its Variation from the Mean of the Year.*

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	75·4	78·9	80·2	...	85·7	81·8	80·2	79·1	79·6	78·0	78·2
2	...	74·2	78·9	79·9	82·7	86·2	82·4	78·6	79·8	...	78·1	78·3
3	77·4	73·0	78·2	...	81·7	85·6	...	79·6	79·9	80·1	78·9	78·9
4	75·0	73·1	77·8	81·2	83·0	85·9	82·2	79·8	...	77·5	79·3	...
5	72·9	73·7	76·4	81·1	82·8	...	81·8	80·1	80·5	78·9	78·6	78·1
6	73·2	...	...	79·6	82·7	86·3	78·6	79·5	80·4	79·8	...	77·9
7	74·4	72·8	77·8	79·9	82·9	81·7	78·4	...	79·7	79·5	77·3	77·6
8	75·7	73·4	77·8	79·2	...	83·6	79·1	78·8	79·6	76·7	78·7	77·8
9	...	74·7	77·0	79·4	82·9	83·6	82·2	79·4	79·3	...	78·2	77·6
10	75·5	74·3	77·2	...	82·7	83·4	...	80·4	78·7	78·4	80·1	78·3
11	73·5	74·3	78·3	80·6	82·7	83·3	78·4	...	...	79·6	80·9	...
12	73·0	74·5	79·3	81·1	83·1	...	77·8	80·9	77·4	79·6	81·3	76·3
13	74·0	...	...	82·6	83·2	84·7	78·7	80·2	79·7	79·0	...	75·2
14	73·6	76·2	78·1	81·1	84·0	82·1	78·8	...	80·2	79·2	80·7	75·9
15	73·1	79·4	78·8	...	...	82·3	80·4	79·6	81·2	80·3	80·2	76·9
16	...	78·3	79·7	81·8	83·7	80·3	78·2	80·1	79·9	...	79·9	76·5
17	68·9	75·9	...	...	83·6	79·9	...	79·8	79·1	81·1	80·2	75·4
18	70·0	74·9	78·8	81·4	82·8	79·2	78·4	80·5	...	82·3	81·0	...
19	72·5	76·8	78·4	82·4	83·6	...	77·7	80·5	78·1	82·9	79·9	78·2
20	70·8	...	...	81·9	83·8	81·0	79·2	78·7	77·6	81·7	...	74·9
21	70·2	79·0	79·9	81·3	84·3	78·0	77·3	...	77·7	81·6	78·5	74·4
22	70·5	76·3	79·6	80·6	...	81·3	78·2	78·9	79·1	81·3	77·7	74·2
23	...	75·6	79·5	81·4	84·1	82·6	80·6	78·6	79·9	...	77·4	74·1
24	73·7	75·9	78·6	...	...	81·8	...	78·1	80·1	79·6	77·2	74·6
25	74·0	77·0	78·1	81·7	85·3	82·4	78·9	78·7	...	78·5	77·2	...
26	75·9	79·4	78·4	82·0	85·0	...	79·8	79·6	79·4	...	78·8	75·6
27	74·5	...	...	82·9	84·7	82·3	79·5	79·4	78·9	78·2	...	74·9
28	75·5	...	81·2	82·9	85·0	82·3	78·8	...	79·0	77·6	79·4	75·5
29	76·6		80·5	81·5	...	82·8	78·7	78·4	78·5	77·7	79·0	75·4
30	...		80·4	82·8	85·4	81·5	79·2	78·2	79·0	...	78·5	74·6
31	75·9		80·4		85·8		...	78·7		77·4		73·7
Monthly Mean.	73·6	75·6	78·8	81·2	83·7	82·7	79·4	79·4	79·3	79·5	79·0	76·3
Annual Variation.	− 5·4	− 3·4	− 0·2	+ 2·2	+ 4·7	+ 3·7	+ 0·4	+ 0·4	+ 0·3	+ 0·5	0·0	− 2·7

	°
Mean of months from April to September	80·9
Mean of months from January to March, and October to December..............	77·1
Mean for the Year..	79·0
The greatest monthly mean (that of May)..	83·7
The least monthly mean (that of January)	73·6
Difference.........	10·1

Temperature of the Air, 1870.

TABLE IV.—*The Mean Diurnal Variation of the Temperature of the Air for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 2·5	− 3·0	− 2·7	− 2·6	− 2·6	− 1·4	− 0·4	− 1·0	− 1·5	− 1·9	− 2·5	− 2·8	− 2·1
1 A.M.	− 2·9	− 3·4	− 3·0	− 3·0	− 2·9	− 1·8	− 0·6	− 1·2	− 1·8	− 2·2	− 2·8	− 3·0	− 2·4
2 „	− 3·4	− 3·8	− 3·2	− 3·4	− 3·1	− 2·1	− 0 8	− 1·3	− 2·0	− 2·5	− 3·1	− 3·4	− 2·7
3 „	− 3·8	− 4·4	− 3·5	− 3·7	− 3·3	− 2·4	− 1·1	− 1·7	− 2·1	− 2·6	− 3·4	− 3·8	− 3·0
4 „	− 4·2	− 4·9	− 4·0	− 4·1	− 3·4	− 2·6	− 1·3	− 1·9	− 2·2	− 2·8	− 3·7	− 4·0	− 3·3
5 „	− 4·6	− 5·0	− 4·4	− 4·5	− 3·5	− 2·6	− 1·1	− 2·0	− 2·2	− 2·9	− 4·0	− 4·2	− 3·4
6 „	− 5·2	− 5·1	− 4·8	− 4·6	− 3·4	− 2·4	− 1·2	− 2·0	− 2·2	− 3·2	− 4·3	− 4·7	− 3·6
7 „	− 5·3	− 4·9	− 4·0	− 2·9	− 2·0	− 1·7	− 0·9	− 1·6	− 1·8	− 2·5	− 3·3	− 4·4	− 2·9
8 „	− 3·3	− 2·8	− 1·9	− 0·9	− 0·5	− 0·7	− 0·2	− 0·8	− 1·2	− 1·1	− 1·6	− 2·7	− 1·5
9 „	− 0·9	− 0·9	+ 0·1	+ 0·7	+ 0·9	+ 0·2	+ 0·1	− 0·1	0·0	− 0·2	0·0	− 0·9	− 0·1
10 „	+ 1·0	+ 1·4	+ 2·0	+ 2·0	+ 1·9	+ 1·2	+ 0·8	+ 0·9	+ 0·1	+ 1·0	+ 1·6	+ 0·7	+ 1·2
11 „	+ 2·7	+ 3·8	+ 3·5	+ 3·3	+ 3·1	+ 1·9	+ 1·3	+ 2·0	+ 1·9	+ 2·3	+ 3·0	+ 2·3	+ 2·6
NOON.	+ 4·7	+ 5·1	+ 4·4	+ 4·4	+ 4·1	+ 2·4	+ 1·6	+ 2·4	+ 2·7	+ 3·5	+ 4·3	+ 4·1	+ 3·6
1 P.M.	+ 5·9	+ 6·3	+ 5·2	+ 5·1	+ 4·4	+ 3·1	+ 1·7	+ 2·9	+ 3·3	+ 4·4	+ 5·4	+ 5·8	+ 4·5
2 „	+ 6·6	+ 6·4	+ 5·7	+ 5·4	+ 4·7	+ 3·7	+ 1·7	+ 3·2	+ 3·8	+ 4·9	+ 6·1	+ 6·9	+ 4·9
3 „	+ 6·6	+ 6·5	+ 5·5	+ 5·4	+ 4·7	+ 3·7	+ 0·9	+ 2·9	+ 3·6	+ 4·8	+ 5·9	+ 6 9	+ 4·8
4 „	+ 6·0	+ 6·0	+ 4·8	+ 4·7	+ 4·0	+ 3·0	+ 0·8	+ 2 2	+ 3·2	+ 4·1	+ 4·8	+ 6·2	+ 4·1
5 „	+ 3·5	+ 4·3	+ 3·5	+ 3·6	+ 2·8	+ 1·9	+ 0·2	+ 1·2	+ 2·0	+ 2·4	+ 2·3	+ 3·2	+ 2·6
6 „	+ 1·6	+ 1·7	+ 1·1	+ 1·2	+ 0·8	+ 0·6	0·0	+ 0·2	+ 0·4	+ 0·7	+ 1·0	+ 1·7	+ 0·9
7 „	+ 0·7	+ 0·6	0·0	− 0·1	− 0·6	− 0·2	0·0	− 0·3	− 0·2	0·0	+ 0·2	+ 0·7	+ 0·1
8 „	+ 0·2	− 0·1	− 0·5	− 0·6	− 1·2	− 0·7	− 0·1	− 0·6	− 0·7	− 0·9	− 0·2	− 0·1	− 0·5
9 „	− 0·5	− 0·8	− 0·9	− 1·2	− 1·7	− 1·0	− 0·2	− 0·9	− 1·0	− 1·2	− 0·9	− 1·0	− 0·9
10 „	− 1·4	− 1·5	− 1·5	− 1·7	− 2·0	− 1·1	− 0·2	− 0·9	− 1·3	− 1·4	− 1·6	− 1·9	− 1·4
11 „	− 2·1	− 2·2	− 2·2	− 2·1	− 2·2	− 1·2	− 0·3	− 1·0	− 1·4	− 1·8	− 2·1	− 2·6	− 1·8

Mean of the hours from 9 P.M. to 8 A.M................ 76°·6 } Difference = 4°·8
Mean of the hours from 9 A.M. to 8 P.M................ 81·4 }

Mean of 24 hours .... 79·0

In the Mean Diurnal Variation for the year a Maximum occurs at 2 P.M., and a Minimum at 6 A.M.

Temperature of the Ground, 1870.

TABLE V.—*Showing, for each Month, the Mean Temperature of the Ground, and its Annual Variation, at the respective depths of* 1, 9, 20, *and* 60 *inches below the surface.*

1870.	DEPTH.							
	1 Inch.		9 Inches.		20 Inches.		60 Inches.	
MONTH.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.	Mean Temperature.	Excess over the Yearly Mean.
	°	°	°	°	°	°	°	°
January	74·8	− 5·2	76·3	− 4·3	79·3	− 3·2	82·5	− 1·2
February	76·4	− 3·6	77·2	− 3·4	79·2	− 3·3	81·9	− 1·8
March	79·6	− 0·4	79·7	− 0·9	81·0	− 1·5	82·0	− 1·7
April	82·0	+ 2·0	81·9	+ 1·3	82·8	+ 0·3	83·3	− 0·4
May	84·6	+ 4·6	84·0	+ 3·4	84·8	+ 2·3	84·8	+ 1·1
June	83·8	+ 3·8	84·3	+ 3·7	85·7	+ 3·2	85·5	+ 1·8
July	80·6	+ 0·6	81·8	+ 1·2	84·2	+ 1·7	85·5	+ 1·8
August	80·5	+ 0·5	81·3	+ 0·7	83·4	+ 0·9	84·6	+ 0·9
September	80·4	+ 0·4	81·0	+ 0·4	83·0	+ 0·5	84·0	+ 0·3
October	80·6	+ 0·6	81·1	+ 0·5	83·0	+ 0·5	83·9	+ 0·2
November	79·9	− 0·1	80·3	− 0·3	82·3	− 0·2	83·4	− 0·3
December	77·2	− 2·8	78·3	− 2·3	81·0	− 1·5	82·9	− 0·8

	DEPTH.			
	1 Inch.	9 Inches.	20 Inches.	60 Inches.
	°	°	°	°
Mean of January to March, and October to December	78·1	78·8	......	......
Do. of January to April, November and December	......	......	80·9	82·7
Do. of April to September	82·0	82·4	......	......
Do. of May to October	......	......	84·0	84·7
Do. for the Year	80·0	80·6	82·5	83·7
Greatest monthly mean (that of May)	84·6	......	......	......
Do. do. (that of June)	......	84·3	85·7	85·5
Least monthly mean (that of January)	74·8	76·3	......	......
Do. do. (that of February)	......	......	79·2	81·9
Difference	9·8	8·0	6·5	3·6

Temperature of the Ground, 1870.

TABLE VI.—*Showing, for each Hour of Bombay Civil Time, the Mean Temperature of the Ground, one and nine inches respectively below the surface, and its Mean Diurnal Variation for the Year.*

1870. Bombay Civil Time.	DEPTH. 1 Inch. Mean Temperature.	DEPTH. 1 Inch. Excess over the mean of 24 hours.	DEPTH. 9 Inches. Mean Temperature.	DEPTH. 9 Inches. Excess over the mean of 24 hours.
	°	°	°	°
Midnight.	78·7	− 1·3	80·6	0·0
1 A.M.	78·4	− 1·6	80·6	0·0
2 „	78·2	− 1·8	80·5	− 0·1
3 „	77·9	− 2·1	80·4	− 0·2
4 „	77·7	− 2·3	80·4	− 0·2
5 „	77·5	− 2·5	80·3	− 0·3
6 „	77·3	− 2·7	80·2	− 0·4
7 „	77·8	− 2·2	80·2	− 0·4
8 „	78·7	− 1·3	80·2	− 0·4
9 „	79·7	− 0·3	80·3	− 0·3
10 „	80·6	+ 0·6	80·4	− 0·2
11 „	81·6	+ 1·6	80·5	− 0·1
Noon.	82·3	+ 2·3	80·6	0·0
1 P.M.	83·0	+ 3·0	80·7	+ 0·1
2 „	83·3	+ 3·3	80·8	+ 0·2
3 „	83·3	+ 3·3	80·9	+ 0·3
4 „	83·0	+ 3·0	81·0	+ 0·4
5 „	82·1	+ 2·1	81·0	+ 0·4
6 „	81·1	+ 1·1	81·0	+ 0·4
7 „	80·4	+ 0·4	80·9	+ 0·3
8 „	80·0	0·0	80·8	+ 0·2
9 „	79·6	− 0·4	80·8	+ 0·2
10 „	79·3	− 0·7	80·7	+ 0·1
11 „	79·0	− 1·0	80·7	+ 0·1

	DEPTH. 1 Inch.	DEPTH. 9 Inches.
	°	°
Mean of hours from 9 P.M. to 8 A.M.	78·3	......
Ditto 9 A.M. to 8 P.M.	81·7	......
Ditto 1 A.M. to Noon	......	80·4
Ditto 1 P.M. to Midnight	......	80·8
Mean of 24 hours	80·0	80·6
Maximum at 2 or 3 P.M.	83·3	......
Ditto 5 P.M.	......	81·0
Minimum at 6 A.M.	77·3	......
Ditto 7 A.M.	......	80·2
Difference	6·0	0·8

Temperature of Evaporation, 1870.

TABLE VII.—*Mean Temperature of Evaporation for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Evaporation and its Variation from the Mean of the Year.*

1870. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	69·2	69·6	72·1	...	78·8	77·8	77·0	75·4	76·0	73·1	70·9
2	...	66·8	70·5	72·7	76·0	78·8	77·7	76·0	75·5	...	71·2	70·1
3	71·3	67·6	70·8	...	75·7	78·4	...	76·5	75·7	77·3	73·7	71·7
4	66·1	67·9	71·3	75·8	77·2	78·4	77·9	76·6	...	75·6	74·4	...
5	62·7	69·5	71·0	75·3	76·9	...	77·8	76·8	75·4	75·8	70·7	71·1
6	64·7	...	...	74·2	76·2	79·9	76·6	76·8	74·9	75·9	...	71·9
7	68·2	68·3	71·0	74·2	76·1	77·5	76·5	...	74·8	76·4	73·6	70·7
8	68·7	69·4	71·6	71·7	...	78·0	76·6	76·2	74·8	75·5	74·7	69·3
9	...	69·8	71·8	73·3	74·8	78·7	77·8	76·8	74·3	...	74·8	66·3
10	66·5	69·2	72·9	...	74·0	78·7	...	77·6	74·1	75·8	76·6	67·3
11	66·5	69·3	71·2	75·1	74·3	78·9	76·3	...	...	76·8	76·8	...
12	66·9	68·7	70·7	75·6	74·2	...	76·3	76·7	74·2	76·1	76·4	67·4
13	65·3	...	...	72·9	74·7	80·1	76·6	76·2	75·4	76·0	...	68·6
14	64·9	66·6	72·0	74·1	75·3	78·5	76·6	...	76·5	76·5	73·7	69·2
15	65·3	67·8	72·3	...	...	78·4	77·7	75·9	78·8	76·7	73·5	68·8
16	...	69·0	73·1	75·8	76·5	78·1	76·4	76·0	78·0	...	70·8	67·8
17	62·1	68·1	...	...	77·0	77·6	...	76·2	77·3	78·3	72·1	68·3
18	62·1	68·3	71·0	76·6	77·6	77·6	76·9	76·4	...	79·2	73·8	...
19	64·5	68·0	68·8	75·7	77·1	...	76·2	76·3	76·6	78·6	73·8	66·7
20	61·1	...	...	76·5	77·1	77·7	76·7	75·5	76·7	75·5	...	66·0
21	61·8	67·4	72·3	75·6	77·6	76·3	75·9	...	76·6	73·2	71·1	68·2
22	62·9	66·7	71·8	75·6	...	77·8	76·4	75·9	77·5	73·4	70·9	67·1
23	...	66·6	72·0	75·6	77·3	78·0	77·7	76·0	76·7	...	71·4	65·4
24	68·4	68·4	70·6	...	...	77·8	...	75·5	76·2	76·8	72·2	67·3
25	68·5	68·0	70·0	75·5	79·3	78·1	76·5	75·4	...	76·5	73·3	...
26	69·0	69·6	72·1	75·2	78·3	...	77·0	75·1	75·7	...	75·7	67·9
27	67·4	...	...	75·0	78·3	77·8	77·0	74·8	75·2	74·9	...	67·8
28	68·7	...	72·6	76·0	77·0	77·5	76·4	...	75·3	74·7	73·4	69·3
29	70·4		74·7	74·9	...	77·7	76·5	74·4	75·1	74·4	71·7	69·6
30	...		73·5	77·2	77·1	77·2	76·5	74·8	75·5	...	69·9	69·1
31	70·1		73·8		78·6		...	75·4		73·1		65·7
Monthly Mean.	66·2	68·3	71·7	74·9	76·6	78·2	76·8	76·0	75·9	76·0	73·2	68·5
Annual Variation.	− 7·3	− 5·2	− 1·8	+ 1·4	+ 3·1	+ 4·7	+ 3·3	+ 2·5	+ 2·4	+ 2·5	− 0·3	− 5·0

	°
Mean of months from January to April, November and December	70·5
Mean of months from May to October	76·6
Mean for the Year......	73·5
The greatest monthly mean (that of June)	78·2
The least monthly mean (that of January)	66·2
Difference	12·0

Temperature of Evaporation, 1870.

Table VIII.—*The Mean Diurnal Variation of the Temperature of Evaporation for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Evaporation above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	− 0·5	− 1·1	− 1·1	− 0·7	− 0·8	− 0·6	− 0·3	− 0·6	− 0·7	− 0·8	− 0·5	− 0·2	− 0·7
1 A.M.	− 1·2	− 1·5	− 0·8	− 1·0	− 0·9	− 0·8	− 0·3	− 0·7	− 0·8	− 1·2	− 0·6	− 0·2	− 0·8
2 „	− 1·5	− 1·7	− 0·7	− 1·3	− 1·1	− 0·8	− 0·6	− 0·8	− 1·0	− 1·1	− 1·1	− 0·8	− 1·0
3 „	− 1·8	− 1·6	− 0·8	− 1·4	− 1·3	− 0·8	− 0·7	− 1·0	− 1·0	− 1·2	− 1·3	− 1·0	− 1·2
4 „	− 2·6	− 2·4	− 1·1	− 1·6	− 1·4	− 1·2	− 0·7	− 1·0	− 0·9	− 1·6	− 1·5	− 1·4	− 1·4
5 „	− 3·2	− 2·6	− 1·5	− 1·8	− 1·4	− 1·2	− 0·6	− 1·1	− 0·8	− 1·5	− 1·7	− 1·7	− 1·6
6 „	− 3·5	− 2·7	− 2·2	− 2·0	− 1·5	− 1·0	− 0·6	− 0·9	− 0·7	− 1·6	− 2·3	− 2·2	− 1·8
7 „	− 4·2	− 2·3	− 2·2	− 1·3	− 0·9	− 0·7	− 0·3	− 0·5	− 0·3	− 1·1	− 1·3	− 1·7	− 1·4
8 „	− 2·9	− 1·4	− 1·5	− 0·6	− 0·4	− 0·2	+ 0·1	+ 0·2	− 0·1	− 0·4	− 0·7	− 1·3	− 0·8
9 „	− 1·6	− 1·0	− 1·1	− 0·2	0·0	+ 0·3	+ 0·3	+ 0·5	+ 0·5	+ 0·1	− 0·5	− 1·2	− 0·3
10 „	− 0·7	− 0·4	− 0·3	0·0	+ 0·4	+ 0·6	+ 0·6	+ 0·9	+ 0·8	+ 0·6	− 0·2	− 1·2	+ 0·1
11 „	0·0	− 0·2	+ 0·9	+ 0·9	+ 0·7	+ 0·8	+ 0·9	+ 1·4	+ 1·2	+ 0·9	− 0·1	− 0·8	+ 0·5
Noon.	+ 0·9	+ 0·9	+ 1·4	+ 1·4	+ 1·2	+ 1·0	+ 1·1	+ 1·5	+ 1·4	+ 1·5	+ 0·2	− 0·2	+ 1·0
1 P.M.	+ 2·2	+ 2·1	+ 1·9	+ 1·8	+ 1·5	+ 1·2	+ 1·1	+ 1·7	+ 1·5	+ 1·8	+ 1·3	+ 0·5	+ 1·5
2 „	+ 3·3	+ 3·0	+ 2·3	+ 1·7	+ 1·5	+ 1·5	+ 1·0	+ 1·6	+ 1·5	+ 2·1	+ 1·8	+ 1·4	+ 1·9
3 „	+ 3·5	+ 3·4	+ 2·0	+ 1·6	+ 1·6	+ 1·5	+ 0·5	+ 1·4	+ 1·2	+ 2·2	+ 2·3	+ 1·8	+ 1·9
4 „	+ 3·3	+ 3·2	+ 1·8	+ 1·4	+ 1·5	+ 1·2	+ 0·4	+ 0·8	+ 0·9	+ 1·7	+ 2·0	+ 2·1	+ 1·7
5 „	+ 2·5	+ 1·7	+ 1·2	+ 1·2	+ 1·0	+ 0·8	0·0	+ 0·2	+ 0·4	+ 0·9	+ 1·3	+ 1·9	+ 1·1
6 „	+ 2·0	+ 1·7	+ 0·5	+ 0·6	+ 0·5	+ 0·1	0·0	− 0·2	− 0·2	+ 0·4	+ 1·0	+ 1·8	+ 0·7
7 „	+ 1·9	+ 1·2	+ 0·1	+ 0·3	+ 0·1	− 0·2	0·0	− 0·4	− 0·4	+ 0·2	+ 0·7	+ 1·8	+ 0·4
8 „	+ 1·8	+ 0·7	0·0	+ 0·4	0·0	− 0·5	− 0·3	− 0·4	− 0·6	− 0·5	+ 0·9	+ 1·6	+ 0·3
9 „	+ 1·3	+ 0·3	+ 0·1	+ 0·3	− 0·2	− 0·5	− 0·2	− 0·6	− 0·8	− 0·6	+ 0·7	+ 1·2	+ 0·1
10 „	+ 0·6	+ 0·1	0·0	+ 0·2	− 0·3	− 0·6	0·0	− 0·5	− 0·9	− 0·8	+ 0·2	+ 0·3	− 0·1
11 „	− 0·4	− 0·6	− 0·2	− 0·2	− 0·5	− 0·6	− 0·2	− 0·6	− 0·8	− 1·1	− 0·5	− 0·1	− 0·5

Mean of the hours from 10 P.M. to 9 A.M.	72°·5
Mean of the hours from 10 A.M. to 9 P.M.	74·4
Mean of 24 hours	73·5

In the Mean Diurnal Variation for the year a Maximum occurs between 2 and 3 P.M., and a Minimum at 6 A.M.

Temperature of Dew-point, 1870.

TABLE IX.—*Mean Temperature of Dew-point (calculated) for each Day of Bombay Civil Time: also the Mean Monthly Temperature of Dew-point and its Variation from the Mean of the Year.*

1870. Date.	MONTH. January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	...	66·2	65·0	68·6	...	76·4	76·3	75·8	74·0	74·7	71·0	67·6
2	...	62·8	66·6	69·6	73·5	76·2	76·1	75·0	73·9	...	68·1	66·3
3	68·6	65·0	67·4	...	73·4	75·9	...	75·3	74·0	76·4	71·6	68·5
4	61·1	65·3	68·4	73·7	75·1	75·7	76·4	75·5	...	74·8	72·3	...
5	56·3	67·6	68·5	73·0	74·6	...	76·4	75·5	73·4	74·6	67·0	67·9
6	59·8	...	...	72·0	73·8	77·7	75·9	75·8	72·7	74·4	...	69·2
7	65·1	66·2	67·9	72·0	73·5	76·1	75·8	...	72·9	75·3	72·0	67·5
8	65·3	67·6	68·9	68·4	...	76·0	75·7	75·3	72·9	75·0	73·2	65·1
9	...	67·6	69·6	70·7	71·6	77·0	76·2	75·8	72·3	...	73·6	59·6
10	61·7	66·8	71·0	...	70·4	77·1	...	76·6	72·3	74·8	75·3	61·2
11	63·1	67·0	67·9	72·9	70·8	77·4	75·6	...	...	75·8	75·3	...
12	63·8	65·9	66·5	73·5	70·5	...	75·7	75·1	72·9	74·8	74·5	62·7
13	60·6	...	...	68·5	71·3	78·5	75·8	74·7	73·8	74·8	...	65·3
14	60·0	61·4	69·4	71·2	71·8	77·3	75·7	...	75·2	75·5	70·8	66·1
15	61·1	61·6	69·5	...	...	77·1	76·7	74·5	78·0	75·5	70·7	64·8
16	...	64·3	70·4	73·5	73·7	77·3	75·7	74·4	77·4	...	66·5	63·2
17	57·9	64·2	...	...	74·6	76·8	...	74·9	76·7	77·3	68·4	64·8
18	57·2	65·1	67·5	74·9	75·7	77·0	76·4	74·9	...	78·2	70·8	...
19	59·9	63·5	64·0	73·1	74·7	...	75·6	74·7	76·1	77·0	71·3	60·0
20	54·5	...	...	74·5	74·6	76·6	75·8	74·3	76·4	73·0	...	60·9
21	56·4	61·0	68·9	73·4	75·2	75·7	75·4	...	76·2	69·5	67·7	65·3
22	58·3	61·5	68·3	73·6	...	76·6	75·7	74·7	76·9	69·9	67·9	63·5
23	...	61·6	68·7	73·3	74·8	76·4	76·6	75·1	75·6	...	68·7	60·6
24	65·8	64·6	67·0	...	...	76·3	...	74·6	74·7	75·8	70·0	63·5
25	65·9	63·3	66·3	73·1	77·2	76·5	75·7	74·2	...	75·8	71·7	...
26	66·2	64·8	69·4	72·5	75·9	...	75·9	73·4	74·3	...	74·5	64·1
27	63·5	...	...	71·8	76·1	76·3	76·0	73·0	73·7	73·6	...	64·2
28	65·4	...	68·7	73·3	74·1	75·9	75·5	...	73·9	73·5	70·8	66·4
29	67·5		72·4	72·3	...	75·9	75·6	72·8	73·8	73·2	68·3	67·0
30	...		70·6	75·1	74·1	75·8	75·6	73·5	74·2	...	65·8	66·5
31	67·4		71·1		76·1		...	74·2		71·4		61·3
Monthly Mean.	62·1	64·6	68·5	72·3	73·9	76·6	75·9	74·8	74·5	74·6	70·7	64·6
Annual Variation.	− 9·0	− 6·5	− 2·6	+ 1·2	+ 2·8	+ 5·5	+ 4·8	+ 3·7	+ 3·4	+ 3·5	− 0·4	− 6·5

	°
Mean of months from January to April, November and December	67·1
Mean of months from May to October	75·0
Mean for the Year	71·1
The greatest monthly mean (that of June)	76·6
The least monthly mean (that of January)	62·1
Difference	14·5

Temperature of Dew-point, 1870.

TABLE X.—*The Mean Diurnal Variation of the Temperature of Dew-point for each Month, and for the whole Year; or the Excess of the Mean Hourly Temperature of Dew-point above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	°	°	°	°	°	°	°	°	°	°	°	°	°
Midnight.	+ 0·5	− 0·2	− 0·5	+ 0·2	− 0·1	− 0·3	− 0·4	− 0·6	− 0·3	− 0·3	+ 0·3	+ 1·1	0·0
1 A.M.	− 0·4	− 0·6	+ 0·1	− 0·1	− 0·2	− 0·4	− 0·3	− 0·6	− 0·4	− 0·8	+ 0·3	+ 1·1	− 0·2
2 ,,	− 0·6	− 0·8	+ 0·4	− 0·5	− 0·4	− 0·3	− 0·7	− 0·6	− 0·5	− 0·5	− 0·3	+ 0·5	− 0·4
3 ,,	− 0·9	− 0·4	+ 0·5	− 0·5	− 0·6	− 0·3	− 0·7	− 0·9	− 0·5	− 0·7	− 0·4	+ 0·3	− 0·4
4 ,,	− 1·9	− 1·3	+ 0·2	− 0·5	− 0·7	− 0·6	− 0·5	− 0·8	− 0·3	− 1·1	− 0·6	− 0·1	− 0·7
5 ,,	− 2·8	− 1·8	− 0·3	− 0·7	− 0·7	− 0·7	− 0·4	− 0·9	− 0·2	− 1·1	− 0·8	− 0·7	− 0·9
6 ,,	− 3·0	− 1·8	− 1·1	− 1·0	− 0·9	− 0·5	− 0·4	− 0·6	− 0·1	− 0·9	− 1·6	− 1·2	− 1·1
7 ,,	− 4·2	− 1·2	− 1·5	− 0·6	− 0·4	− 0·3	− 0·2	− 0·2	+ 0·3	− 0·5	− 0·5	− 0·6	− 0·8
8 ,,	− 3·2	− 0·9	− 1·5	− 0·4	− 0·5	0·0	+ 0·2	+ 0·5	+ 0·4	− 0·1	− 0·4	− 0·8	− 0·6
9 ,,	− 2·4	− 1·4	− 1·9	− 0·6	− 0·4	+ 0·4	+ 0·3	+ 0·6	+ 0·8	+ 0·2	− 0·8	− 1·6	− 0·6
10 ,,	− 1·9	− 1·6	− 1·4	− 0·9	− 0·2	+ 0·5	+ 0·5	+ 0·9	+ 0·9	+ 0·5	− 1·1	− 2·5	− 0·5
11 ,,	− 1·6	− 2·7	− 0·3	0·0	− 0·1	+ 0·4	+ 0·8	+ 1·2	+ 1·1	+ 0·4	− 1·5	− 2·7	− 0·4
Noon.	− 1·2	− 1·6	+ 0·1	+ 0·3	+ 0·2	+ 0·5	+ 0·9	+ 1·2	+ 1·1	+ 0·8	− 1·6	− 2·8	− 0·2
1 P.M.	+ 0·5	+ 0·1	+ 0·6	+ 0·6	+ 0·5	+ 0·6	+ 0·9	+ 1·3	+ 0·9	+ 0·9	− 0·5	− 2·5	+ 0·3
2 ,,	+ 2·0	+ 1·8	+ 1·0	+ 0·5	+ 0·4	+ 0·9	+ 0·7	+ 1·0	+ 0·9	+ 1·3	+ 0·1	− 1·4	+ 0·8
3 ,,	+ 2·4	+ 2·3	+ 0·6	+ 0·2	+ 0·5	+ 0·8	+ 0·4	+ 0·8	+ 0·5	+ 1·4	+ 0·9	− 0·8	+ 0·8
4 ,,	+ 2·6	+ 2·3	+ 0·7	+ 0·3	+ 0·7	+ 0·7	+ 0·2	+ 0·2	+ 0·1	+ 0·9	+ 1·0	+ 0·3	+ 0·8
5 ,,	+ 2·4	+ 2·2	+ 0·3	+ 0·4	+ 0·5	+ 0·4	− 0·1	− 0·3	− 0·2	+ 0·5	+ 1·0	+ 1·5	+ 0·7
6 ,,	+ 2·6	+ 1·9	+ 0·3	+ 0·5	+ 0·4	0·0	− 0·1	− 0·4	− 0·4	+ 0·4	+ 1·1	+ 2·0	+ 0·7
7 ,,	+ 2·9	+ 1·6	+ 0·2	+ 0·5	+ 0·5	− 0·2	− 0·1	− 0·5	− 0·4	+ 0·4	+ 1·0	+ 2·5	+ 0·7
8 ,,	+ 3·0	+ 1·1	+ 0·3	+ 0·9	+ 0·5	− 0·4	− 0·4	− 0·5	− 0·6	− 0·3	+ 1·5	+ 2·6	+ 0·6
9 ,,	+ 2·5	+ 1·0	+ 0·6	+ 1·0	+ 0·3	− 0·4	− 0·2	− 0·6	− 0·7	− 0·3	+ 1·5	+ 2·4	+ 0·6
10 ,,	+ 1·9	+ 1·2	+ 0·8	+ 1·0	+ 0·3	− 0·3	0·0	− 0·5	− 0·7	− 0·5	+ 1·0	+ 1·4	+ 0·5
11 ,,	+ 0·6	+ 0·3	+ 0·7	+ 0·6	+ 0·1	− 0·4	− 0·2	− 0·5	− 0·5	− 0·8	+ 0·2	+ 1·1	+ 0·1

Mean of the hours from 1 A.M. to Noon	70°·5
Mean of the hours from 1 P.M. to Midnight	71·6
Mean of 24 hours	71·1

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M., and a Minimum at 6 A.M.

Maxima and Minima of different Meteorological Elements, 1870.

TABLE XI.—*In which are collected the individual observations in each month of the year* 1870, *which showed the greatest and the least values of the following elements, viz., Height of Barometer, corrected for Temperature; Temperature of Air; Temperature of Evaporation; and Temperature of Dew-point.*

1870. Month.	Height of Barometer.			Temperature of Air.			Temperature of Evaporation.			Temperature of Dew-point.		
	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.	Greatest.	Least.	Range.
	in.	in.	in.	°	°	°	°	°	°	°	°	°
January	29·995	29·784	0·211	83·3	62·9	20·4	74·3	53·8	20·5	71·7	45·4	26·3
February	30·027	·761	·266	92·7	67·1	25·6	75·7	57·5	18·2	71·6	39·6	32·0
March	29·987	·690	·297	87·6	71·8	15·8	77·2	64·0	13·2	74·1	55·7	18·4
April	·930	·644	·286	89·1	74·1	15·0	80·1	67·1	13·0	77·6	58·6	19·0
May	·890	·589	·301	90·7	77·8	12·9	81·0	71·5	9·5	79·1	68·0	11·1
June...........	·850	·418	·432	91·8	75·8	16·0	82·2	73·7	8·5	79·8	72·1	7·7
July...........	·740	·521	·219	86·6	75·3	11·3	80·9	73·3	7·6	79·6	73·5	6·1
August.........	·807	·613	·194	85·3	74·9	10·4	79·9	72·5	7·4	78·3	70·8	7·5
September ...	·893	·484	·409	86·4	73·3	13·1	81·3	71·8	9·5	80·0	70·3	9·7
October	·967	·589	·378	89·6	72·2	17·4	81·4	69·1	12·3	80·4	60·3	20·1
November ...	30·061	·720	·341	89·7	72·5	17·2	79·6	65·9	13·7	77·3	58·9	18·4
December ...	·094	·758	·336	87·2	68·5	18·7	75·3	59·8	15·5	73·3	47·9	25·4
Year...........	30·094	29·418	0·676	92·7	62·9	29·8	82·2	53·8	28·4	80·4	39·6	40·8

Pressure of Vapour, 1870.

TABLE XII.—*Mean Pressure of Vapour for each Day of Bombay Civil Time: also the Mean Monthly Pressure of Vapour and its Variation from the Mean of the Year.*

1870. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	...	0·646	0·622	0·700	...	0·910	0·907	0·891	0·838	0·859	0·759	0·679
2	...	·573	·657	·724	0·825	·903	·900	·867	·836	...	·688	·647
3	0·700	·626	·673	...	·822	·894	...	·877	·841	·910	·775	·698
4	·542	·625	·695	·831	·870	·888	·910	·882	...	·864	·795	...
5	·457	·676	·697	·814	·857	...	·908	·884	·822	·857	·664	·682
6	·523	...	...	·786	·833	·949	·893	·893	·803	·852	...	·715
7	·623	·643	·683	·783	·825	·900	·891	...	·809	·876	·790	·674
8	·626	·676	·705	·695	...	·900	·888	·877	·809	·869	·817	·623
9	...	·675	·724	·754	·774	·928	·903	·893	·794	...	·827	·519
10	·553	·658	·760	...	·743	·929	...	·914	·792	·861	·876	·550
11	·579	·662	·683	·809	·754	·940	·884	...	...	·890	·875	...
12	·591	·634	·655	·825	·745	...	·888	·872	·810	·865	·854	·571
13	·530	...	...	·702	·767	·976	·892	·860	·832	·865	...	·625
14	·523	·554	·718	·766	·781	·937	·890	...	·873	·884	·755	·641
15	·540	·555	·722	...	...	·930	·918	·855	·959	·883	·752	·616
16	...	·608	·744	·825	·831	·938	·889	·851	·939	...	·655	·583
17	·482	·602	...	...	·856	·921	...	·864	·919	·938	·698	·613
18	·475	·620	·673	·864	·888	·928	·908	·864	...	·965	·756	...
19	·519	·595	·599	·815	·861	...	·885	·860	·900	·930	·766	·529
20	·432	...	...	·854	·857	·915	·891	·848	·910	·814	...	·538
21	·460	·547	·709	·823	·874	·888	·878	...	·905	·725	·679	·625
22	·496	·553	·694	·829	...	·914	·889	·860	·924	·740	·683	·588
23	...	·555	·701	·820	·863	·908	·917	·870	·885	...	·704	·531
24	·637	·611	·661	...	...	·907	...	·855	·859	·890	·734	·586
25	·638	·591	·645	·814	·934	·913	·887	·845	...	·891	·777	...
26	·644	·616	·720	·798	·895	...	·895	·823	·848	...	·854	·598
27	·592	...	...	·780	·899	·905	·898	·812	·832	·830	...	·600
28	·629	...	·708	·820	·841	·889	·882	...	·837	·826	·755	·652
29	·675		·797	·794	...	·894	·887	·806	·835	·817	·695	·662
30	...		·749	·871	·841	·888	·884	·825	·845	...	·636	·652
31	·671		·761		·899		...	·844		·769		·547
Monthly Mean.	0·566	0·613	0·698	0·797	0·837	0·915	0·895	0·861	0·856	0·859	0·755	0·613
Annual Variation.	−0·206	−0·159	−0·074	+0·025	+0·065	+0·143	+0·123	+0·089	+0·084	+0·087	−0·017	−0·159

	in.
Mean of months from January to April, November and December	0·674
Mean of months from May to October	0·870
Mean for the Year	0·772
The greatest monthly mean (that of June)	0·915
The least monthly mean (that of January)	0·566
Difference	0·349

Pressure of Vapour, 1870.

TABLE XIII.—*The Mean Diurnal Variation of the Pressure of Vapour for each Month and for the whole Year; or the Excess of the Mean Hourly Pressure above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Midnight.	+0·011	−0·006	−0·009	+0·002	−0·003	−0·010	−0·013	−0·017	−0·010	−0·010	+0·006	+0·021	− ·003
1 A.M.	− ·009	− ·013	+ ·003	− ·009	− ·005	− ·012	− ·009	− ·017	− ·012	− ·022	+ ·006	+ ·022	− ·006
2 „	− ·014	− ·016	+ ·009	− ·015	− ·010	− ·009	− ·020	− ·017	− ·015	− ·015	− ·007	+ ·008	− ·010
3 „	− ·019	− ·013	+ ·012	− ·017	− ·016	− ·007	− ·020	− ·024	− ·017	− ·019	− ·011	+ ·004	− ·012
4 „	− ·038	− ·026	+ ·005	− ·017	− ·019	− ·021	− ·018	− ·021	− ·011	− ·030	− ·017	− ·005	− ·018
5 „	− ·053	− ·034	− ·007	− ·022	− ·019	− ·022	− ·014	− ·024	− ·007	− ·029	− ·022	− ·015	− ·022
6 „	− ·055	− ·035	− ·026	− ·030	− ·025	− ·015	− ·013	− ·017	− ·004	− ·026	− ·041	− ·026	− ·026
7 „	− ·075	− ·026	− ·033	− ·019	− ·011	− ·011	− ·006	− ·005	+ ·008	− ·015	− ·015	− ·013	− ·018
8 „	− ·059	− ·018	− ·033	− ·013	− ·012	+ ·001	+ ·004	+ ·015	+ ·009	− ·002	− ·011	− ·016	− ·011
9 „	− ·043	− ·028	− ·040	− ·017	− ·009	+ ·012	+ ·008	+ ·019	+ ·010	+ ·007	− ·020	− ·034	− ·011
10 „	− ·037	− ·032	− ·031	− ·022	− ·003	+ ·014	+ ·016	+ ·027	+ ·025	+ ·014	− ·026	− ·051	− ·009
11 „	− ·032	− ·052	− ·004	− ·002	− ·002	+ ·014	+ ·023	+ ·036	+ ·029	+ ·013	− ·037	− ·057	− ·006
Noon.	− ·025	− ·027	+ ·005	+ ·006	+ ·006	+ ·017	+ ·026	+ ·035	+ ·029	+ ·025	− ·039	− ·055	·000
1 P.M.	+ ·007	+ ·004	+ ·017	+ ·014	+ ·014	+ ·018	+ ·027	+ ·039	+ ·026	+ ·027	− ·010	− ·049	+ ·011
2 „	+ ·039	+ ·037	+ ·026	+ ·010	+ ·013	+ ·027	+ ·021	+ ·031	+ ·024	+ ·037	+ ·004	− ·025	+ ·020
3 „	+ ·047	+ ·049	+ ·017	+ ·002	+ ·016	+ ·024	+ ·011	+ ·025	+ ·013	+ ·040	+ ·024	− ·012	+ ·021
4 „	+ ·050	+ ·047	+ ·018	+ ·006	+ ·019	+ ·022	+ ·006	+ ·006	+ ·002	+ ·026	+ ·026	+ ·007	+ ·020
5 „	+ ·045	+ ·046	+ ·007	+ ·008	+ ·013	+ ·014	− ·003	− ·006	− ·006	+ ·012	+ ·025	+ ·031	+ ·015
6 „	+ ·048	+ ·038	+ ·008	+ ·010	+ ·011	·000	− ·004	− ·011	− ·012	+ ·010	+ ·026	+ ·042	+ ·014
7 „	+ ·055	+ ·032	+ ·006	+ ·012	+ ·013	− ·005	− ·003	− ·012	− ·012	+ ·011	+ ·023	+ ·054	+ ·014
8 „	+ ·057	+ ·022	+ ·007	+ ·022	+ ·013	− ·012	− ·014	− ·012	− ·018	− ·010	+ ·037	+ ·055	+ ·012
9 „	+ ·047	+ ·018	+ ·016	+ ·025	+ ·010	− ·011	− ·008	− ·016	− ·022	− ·010	+ ·036	+ ·052	+ ·011
10 „	+ ·033	+ ·018	+ ·018	+ ·026	+ ·011	− ·011	+ ·001	− ·012	− ·020	− ·014	+ ·026	+ ·031	+ ·009
11 „	+ ·008	+ ·004	+ ·016	+ ·013	+ ·004	− ·013	− ·007	− ·014	− ·017	− ·023	+ ·005	+ ·022	·000

	in.
Mean of the hours from Midnight to 11 A.M.	0·759
Mean of the hours from Noon to 11 P.M.	0·784
Mean of 24 hours	0·772

In the Mean Diurnal Variation for the year a Maximum occurs at 3 P.M., and a Minimum at 6 A.M.

Relative Humidity of the Air, 1870.

TABLE XIV.—*Mean Relative Humidity of the Air for each Day of Bombay Civil Time: also the Monthly Mean Relative Humidity and its Variation from the Mean of the Year.*

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	·746	·633	·681	...	·743	·836	·867	·845	·852	·794	·708
2	...	·687	·673	·713	·742	·726	·815	·887	·825	...	·714	·678
3	·748	·767	·701	...	·762	·732	...	·869	·825	·883	·788	·715
4	·624	·776	·737	·789	·774	·721	·828	·868	...	·916	·799	...
5	·566	·816	·773	·777	·766	...	·836	·861	·793	·870	·687	·716
6	·633	...	...	·782	·749	·760	·916	·889	·776	·840	...	·751
7	·731	·802	·720	·774	·739	·834	·919	...	·802	·871	·841	·720
8	·707	·824	·749	·702	...	·782	·896	·893	·803	·945	·836	·665
9	...	·792	·786	·754	·691	·811	·821	·889	·796	...	·860	·564
10	·632	·778	·816	...	·668	·817	...	·883	·807	·889	·857	·574
11	·705	·782	·711	·779	·684	·829	·912	...	...	·883	·835	...
12	·738	·751	·663	·783	·661	...	·932	·829	·866	·857	·803	·638
13	·636	...	...	·644	·678	·821	·911	·837	·824	·872	...	·725
14	·632	·605	·752	·725	·671	·857	·904	...	·850	·886	·725	·724
15	·665	·562	·738	...	...	·847	·886	·848	·901	·858	·736	·678
16	...	·632	·740	·762	·726	·906	·923	·831	·920	...	·650	·647
17	·684	·676	...	...	·746	·902	...	·849	·926	·887	·681	·704
18	·644	·719	·690	·811	·795	·932	·935	·832	...	·879	·726	...
19	·651	·640	·621	·742	·753	...	·931	·828	·938	·832	·757	·558
20	·576	...	...	·786	·744	·864	·895	·865	·961	·758	...	·634
21	·626	·570	·697	·778	·747	·928	·937	...	·955	·681	·708	·734
22	·661	·607	·691	·798	...	·857	·923	·873	·930	·693	·726	·699
23	...	·633	·701	·772	·741	·816	·878	·893	·868	...	·750	·635
24	·769	·696	·681	...	...	·835	...	·891	·839	·883	·795	·689
25	·761	·635	·675	·756	·773	·828	·897	·862	...	·914	·832	...
26	·745	·619	·742	·737	·745	...	·881	·817	·847	...	·871	·690
27	·698	...	...	·697	·758	·822	·891	·812	·844	·864	...	·700
28	·723	...	·666	·733	·705	·806	·897	...	·849	·875	·756	·739
29	·745		·771	·742	...	·799	·904	·830	·858	·864	·710	·757
30	...		·728	·775	·694	·826	·886	·856	·855	...	·661	·764
31	·755		·735		·732		...	·861		·820		·663
Monthly Mean.	·682	·701	·715	·752	·730	·823	·892	·858	·858	·855	·765	·684
Annual Variation.	− ·094	− ·075	− ·061	− ·024	− ·046	+ ·047	+ ·116	+ ·082	+ ·082	+ ·079	− ·011	− ·092

Mean of the months from January to May, and December	·711
Mean of the months from June to November	·842
Mean for the Year	·776
The greatest monthly mean (that of July)	·892
The least monthly mean (that of January)	·682
Difference	·210

Relative Humidity of the Air, 1870.

Table XV.—*The Mean Diurnal Variation of Relative Humidity of the Air for each Month, and for the whole Year; or the Excess of the Mean Hourly Relative Humidity above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	+ ·072	+ ·058	+ ·050	+ ·066	+ ·056	+ ·026	− ·001	+ ·012	+ ·031	+ ·044	+ ·067	+ ·083	+ ·047
1 A.M.	+ ·056	+ ·061	+ ·073	+ ·064	+ ·061	+ ·035	+ ·010	+ ·017	+ ·036	+ ·038	+ ·075	+ ·089	+ ·051
2 "	+ ·062	+ ·067	+ ·085	+ ·070	+ ·063	+ ·047	+ ·006	+ ·020	+ ·040	+ ·053	+ ·071	+ ·085	+ ·056
3 "	+ ·064	+ ·090	+ ·094	+ ·077	+ ·062	+ ·056	+ ·013	+ ·023	+ ·042	+ ·055	+ ·073	+ ·088	+ ·061
4 "	+ ·049	+ ·084	+ ·101	+ ·086	+ ·062	+ ·049	+ ·019	+ ·034	+ ·049	+ ·047	+ ·074	+ ·082	+ ·061
5 "	+ ·038	+ ·074	+ ·099	+ ·092	+ ·064	+ ·046	+ ·018	+ ·033	+ ·054	+ ·052	+ ·079	+ ·077	+ ·060
6 "	+ ·046	+ ·077	+ ·085	+ ·085	+ ·055	+ ·050	+ ·023	+ ·040	+ ·059	+ ·060	+ ·067	+ ·075	+ ·060
7 "	+ ·021	+ ·084	+ ·057	+ ·053	+ ·033	+ ·035	+ ·022	+ ·040	+ ·059	+ ·055	+ ·069	+ ·086	+ ·051
8 "	− ·005	+ ·042	+ ·005	+ ·008	− ·005	+ ·018	+ ·012	+ ·037	+ ·042	+ ·027	+ ·024	+ ·040	+ ·020
9 "	− ·038	− ·015	− ·048	− ·036	− ·033	+ ·005	+ ·005	+ ·022	+ ·020	+ ·013	− ·022	− ·022	− ·012
10 "	− ·068	− ·067	− ·077	− ·068	− ·050	− ·019	− ·008	+ ·002	− ·001	− ·016	− ·065	− ·075	− ·043
11 "	− ·096	− ·128	− ·084	− ·080	− ·073	− ·036	− ·013	− ·021	− ·020	− ·050	− ·105	− ·112	− ·068
Noon.	− ·125	− ·128	− ·095	− ·101	− ·088	− ·046	− ·019	− ·031	− ·046	− ·067	− ·133	− ·144	− ·085
1 P.M.	− ·115	− ·126	− ·101	− ·106	− ·089	− ·062	− ·020	− ·043	− ·064	− ·088	− ·131	− ·166	− ·093
2 "	− ·098	− ·103	− ·103	− ·116	− ·097	− ·067	− ·025	− ·057	− ·116	− ·092	− ·132	− ·163	− ·097
3 "	− ·090	− ·096	− ·107	− ·120	− ·090	− ·072	− ·012	− ·053	− ·084	− ·087	− ·113	− ·154	− ·090
4 "	− ·073	− ·088	− ·093	− ·104	− ·076	− ·056	− ·015	− ·054	− ·083	− ·085	− ·089	− ·125	− ·078
5 "	− ·028	− ·055	− ·077	− ·080	− ·056	− ·037	− ·007	− ·036	− ·062	− ·053	− ·034	− ·046	− ·048
6 "	+ ·018	− ·006	− ·024	− ·022	− ·015	− ·017	− ·003	− ·016	+ ·015	− ·011	− ·001	·000	− ·007
7 "	+ ·047	+ ·014	− ·001	+ ·011	+ ·021	− ·001	− ·001	− ·002	− ·007	+ ·010	+ ·015	+ ·033	+ ·012
8 "	+ ·063	+ ·020	+ ·014	+ ·033	+ ·037	+ ·004	− ·010	+ ·007	·000	+ ·014	+ ·042	+ ·054	+ ·023
9 "	+ ·068	+ ·033	+ ·033	+ ·051	+ ·046	+ ·014	− ·001	+ ·008	+ ·005	+ ·024	+ ·056	+ ·072	+ ·034
10 "	+ ·075	+ ·051	+ ·051	+ ·063	+ ·053	+ ·017	+ ·006	+ ·013	+ ·011	+ ·025	+ ·064	+ ·071	+ ·042
11 "	+ ·059	+ ·050	+ ·065	+ ·062	+ ·052	+ ·018	+ ·002	+ ·014	+ ·021	+ ·028	+ ·057	+ ·077	+ ·042

Mean of the hours from 8 A.M. to 7 P.M.	·727
Mean of the hours from 8 P.M. to 7 A.M.	·825
Mean of 24 hours..	·776

In the Mean Diurnal Variation for the year a Maximum occurs between 3 and 4 A.M., and a Minimum at 2 P.M.

Extent of Cloudy Sky, 1870.

TABLE XVI.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) for each Day of Bombay Civil Time: also the Mean Monthly Extent and its Variation from the Mean of the Year.*

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
1	...	5·7		6·4	...	3·6	6·1	7·2	6·9	5·7	1·7	
2	...	3·7	1·7	1·2	4·0	2·9	7·2	7·8	5·9	...	4·7	0·4
3	0·4		3·3	...	6·6	5·7	...	7·7	6·0	6·9	2·7	2·7
4	1·5		1·4	0·2	4·3	5·0	7·4	7·5	...	6·9	0·5	...
5	1·4	1·8	0·7	0·9	2·1	...	7·0	6·4	7·1	6·3	2·5	3·1
6	1·3	...	...	0·9	4·0	6·1	8·0	7·2	6·1	7·4	...	5·2
7	0·3	0·4	2·5		4·7	7·6	8·0	...	6·0	6·5	7·7	4·0
8	0·2	1·4	3·5	0·9	...	6·4	8·0	7·3	4·8	8·0	2·8	2·5
9	...	1·6	5·0	2·8	4·4	7·0	7·3	8·0	5·2	...	1·7	3·0
10	0·1		4·5	...	2·7	5·8	...	7·9	5·7	6·1	1·7	3·2
11	3·1		3·5	1·8	5·8	7·8	7·9	...	...	5·5	0·5	...
12	4·8	2·9	2·6	0·6	4·4	...	8·0	7·8	7·3	4·6	2·7	
13	3·1	...	...		3·8	6·8	8·0	7·7	6·0	5·7	...	0·7
14			5·9		4·5	7·5	8·0	...	7·7	4·6	1·9	
15	0·2	2·5	3·6	...	...	7·6	8·0	7·7	7·6	6·4	2·6	
16	...		7·1	2·4	3·2	8·0	8·0	7·7	7·9	...	4·1	0·2
17	3·9		...	...	6·1	7·5	...	7·9	8·0	2·3	3·0	0·9
18	0·5		5·6	2·2	6·7	8·0	8·0	7·7	...	5·0	1·9	...
19	3·7		6·8		3·6	...	8·0	7·7	7·8	3·8	1·5	
20	0·2	...	...		4·3	7·7	8·0	7·7	8·0	4·0	...	0·2
21	0·6		3·6	0·6	3·6	8·0	8·0	...	7·9	5·0	2·0	2·6
22			2·5	0·7	...	7·7	8·0	6·7	7·7	6·4	1·4	0·7
23	...		3·4	0·9	5·1	5·9	8·0	6·6	5·9	...	1·9	
24			0·7	...	...	5·7	...	6·7	4·8	8·0	0·7	0·7
25	2·9		0·5	1·2	5·7	6·0	7·9	6·7	...	7·5	2·1	...
26	3·4			3·1	5·6	...	7·9	5·3	4·3	...	4·3	0·7
27	3·7	...	...	3·3	5·1	5·4	8·0	3·5	4·8		...	1·8
28	5·1	...	0·9	2·0	4·1	6·1	8·0	...	6·1	2·3	0·5	3·8
29	5·0		1·2	1·6	...	5·7	8·0	7·1	4·6	2·4		0·7
30	...		0·1	3·2	2·6	7·4	8·0	7·9	3·6	...		0·7
31	0·4		3·2		3·9		...	7·8		0·2		1·9
Monthly Mean.	1·8	0·9	2·8	1·5	4·4	6·5	7·8	7·2	6·3	5·1	2·2	1·5
Annual Variation.	− 2·2	− 3·1	− 1·2	− 2·5	+ 0·4	+ 2·5	+ 3·8	+ 3·2	+ 2·3	+ 1·1	− 1·8	− 2·5

For the days which have no entry 0·0 is to be understood.

Mean of the months from January to April, November and December.........	1·8
Mean of the months from May to October	6·2
Mean for the Year	4·0
The greatest monthly mean (that of July)	7·8
The least monthly mean (that of February)	0·9
Difference...........	6·9

Extent of Cloudy Sky, 1870.

TABLE XVII.—*Mean Extent of Cloudy Sky (the whole Sky being equal to* 8 *parts) in each Month, and for the whole Year, for each Hour of Bombay Civil Time.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
Midnight.	0·8	0·7	2·8	1·9	4·2	6·7	7·7	6·9	5·9	5·2	1·7	1·0	3·8
1 A.M.	0·9	0·6	2·6	1·8	4·0	7·2	7·8	7·0	6·0	5·4	2·3	1·0	3·9
2 "	0·8	0·3	3·0	2·1	4·5	7·0	7·7	7·2	5·8	5·5	2·5	0·9	3·9
3 "	0·9	0·4	3·3	1·6	4·9	6·8	7·6	7·4	6·2	5·0	2·3	1·1	4·0
4 "	0·8	0·1	2·8	1·4	4·6	6·7	7·5	7·3	6·3	4·8	2·1	1·3	3·8
5 "	0·9	0·3	3·0	2·2	5·6	7·2	7·6	7·1	6·4	4·8	1·9	0·9	4·0
6 "	1·3	1·6	4·0	2·3	6·0	7·0	7·7	7·5	7·6	5·1	2·9	1·7	4·6
7 "	3·1	2·0	3·8	2·8	5·8	6·7	7·9	7·5	7·7	5·0	2·8	2·1	4·8
8 "	3·4	1·7	3·2	2·8	5·2	6·7	7·9	7·6	7·0	5·2	2·8	2·3	4·6
9 "	3·1	1·4	2·6	2·0	4·8	6·6	7·9	7·5	6·5	5·1	2·5	1·7	4·3
10 "	3·2	1·2	2·7	1·0	4·4	6·1	7·9	7·7	6·8	5·0	2·4	1·9	4·2
11 "	3·0	1·0	2·6	0·6	4·0	5·8	7·8	7·4	7·3	4·6	2·6	1·9	4·0
Noon.	2·7	1·1	2·8	0·6	4·2	6·0	7·9	7·6	6·8	4·3	3·1	2·2	4·1
1 P.M.	2·6	1·0	2·7	0·7	4·0	6·1	7·9	7·3	6·7	3·8	2·8	1·8	3·9
2 "	2·8	1·0	2·9	0·6	3·6	5·7	7·9	7·2	6·4	3·9	2·5	1·9	3·9
3 "	2·6	0·9	2·6	0·6	3·2	6·0	8·0	6·9	6·7	4·5	2·7	2·1	3·9
4 "	2·5	0·7	2·9	0·6	3·9	6·1	8·0	7·2	6·2	5·4	2·6	1·7	4·0
5 "	2·3	0·7	3·2	0·7	3·9	6·5	8·0	7·5	6·4	5·8	2·9	2·1	4·2
6 "	2·4	0·6	3·3	1·3	4·6	6·9	8·0	7·7	6·3	6·3	1·7	1·8	4·2
7 "	1·2	0·7	2·4	1·4	5·2	6·7	8·0	7·3	4·9	5·4	0·9	0·9	3·7
8 "	1·1	0·7	2·3	1·4	3·8	5·9	7·8	6·9	5·4	5·3	0·8	0·8	3·5
9 "	0·8	0·7	2·0	1·4	3·9	6·2	7·3	6·3	5·1	5·8	1·1	0·6	3·4
10 "	0·6	0·7	2·2	1·6	3·7	6·7	7·6	6·3	5·2	5·5	1·3	0·6	3·5
11 "	0·5	0·7	2·3	1·8	4·3	6·7	7·6	6·7	5·7	5·6	1·3	0·9	3·7

Rainfall, 1870.

TABLE XVIII.—*Total Fall of Rain (in inches) as measured by Newman's Gauge, placed 4½ feet above the ground, for each Day, and each Month of the Year.*

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
			in.	in.		in.	in.	in.	in.	in.		
1				0·02		0·00	0·28	0·07	0·00			
2						0·00	0·09	0·35	0·00			
3						0·00	0·34	0·16	0·01	0·69		
4						0·00	0·14	0·08	0·01			
5						0·02	0·16	0·04	0·00			
6						0·00	1·25	0·18	0·00			
7						1·90	0·42	0·72	0·00	0·01		
8						0·00	0·51	0·28	0·00	1·65		
9						0·08	0·00	0·24	0·00	0·43		
10						0·10	0·61	0·27	0·04	0·03		
11						0·10	1·08	0·01	0·27			
12						0·08	1·09	0·00	0·29			
13						0·97	0·86	0·00	0·00	1·49		
14						1·43	1·09	0·05	0·02			
15						0·04	0·48	0·22	0·21	0·01		
16						1·02	1·74	0·02	0·68			
17			0·03			1·54	4·34	0·11	0·11			
18						4·71	1·82	0·01	0·05			
19						2·97	2·07	0·02	1·25			
20						0·65	0·21	0·36	0·76			
21						3·59	1·74	0·32	1·26			
22						0·55	2·18	0·22	1·62			
23						0·03	0·00	1·30	0·00	0·34		
24						0·13	0·21	0·35	0·00			
25						0·04	0·79	0·03	0·47			
26						1·63	0·29	0·02	0·01			
27						0·02	0·29	0·02	0·02			
28						0·04	1·13	0·12	0·00			
29						0·01	0·66	0·33	0·00			
30						0·08	0·18	0·15	0·00			
31							0·38	0·22				
Monthly Total.			0·03	0·02		21·73	26·43	6·27	7·08	4·65		
No. of rainy days.			1	1		24	29	29	17	8		

Total fall of rain in the year .... 66·21 inches.
Total number of rainy days in the year 109
The greatest fall of rain in one month (July) .... 26·43 inches.

No rain fell in the months January, February, May, November and December, nor on any of the days left blank in the above table.

Rainfall, 1870.

TABLE XIX.—*Total Fall of Rain, as Measured by Newman's Gauge, placed 4½ feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
				in.		in.	in.	in.	in.	in.			in.
12 to 1 A.M.						0·82	0·80	0·19	0·24	0·06			2·11
1 „ 2 „						0·56	1·31	0·09	0·35	0·06			2·37
2 „ 3 „						0·90	0·85	0·73	0·26	0·51			3·25
3 „ 4 „						1·33	0·66	0·26	0·76	0·13			3·14
4 „ 5 „						0·15	1·01	0·06	0·57	0·02			1·81
5 „ 6 „						0·46	0·60	0·09	0·53				1·68
6 „ 7 „						0·43	0·80	0·48	0·65	0·09			2·45
7 „ 8 „						0·07	0·93	0·55	0·44	0·11			2·10
8 „ 9 „						0·08	0·91	0·14	0·02	0·03			1·18
9 „ 10 „						0·13	1·02	0·30	0·08				1·53
10 „ 11 „						0·22	1·11	0·04					1·37
11 „ 12 „						1·01	1·95	0·23	0·09				3·28
12 „ 1 P.M.						1·11	1·37	0·22	0·04	0·01			2·75
1 „ 2 „						1·25	0·79	0·09	0·02				2·15
2 „ 3 „						0·41	1·01	0·13					1·55
3 „ 4 „						0·27	1·60	0·05					1·92
4 „ 5 „						0·77	0·85	0·39		0·18			2·19
5 „ 6 „						0·77	0·45	0·22	0·51	0·51			2·46
6 „ 7 „						1·84	0·30	0·08	0·16	0·15			2·53
7 „ 8 „						1·13	0·42	0·10	0·58	1·61			3·84
8 „ 9 „						0·75	0·63	0·04	0·54	0·11			2·07
9 „ 10 „						1·08	0·41	0·25	0·21				1·95
10 „ 11 „						0·41	0·12	0·18	0·12	0·20			1·03
11 to 12 „				0·02		1·08	0·65	0·14	0·11	0·10			2·10

The above table includes the Rainfall on week-days only.

Rainfall, 1870.

TABLE XX.—*Total Fall of Rain (in inches) as measured by Osler's Gauge, placed 46 feet above the ground, for each Day and each Month of the Year.*

1870. Date.	MONTH.											
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
			in.	in.		in.	in.	in.	in.	in.		
1				0·02			0·23	0·05				
2							0·09	0·28				
3							0·29	0·14	0·01	0·57		
4							0·12	0·07	0·01			
5						0·01	0·15	0·04				
6							1·19	0·16				
7						1·79	0·37	0·67				
8							0·43	0·28		1·61		
9						0·06		0·22		0·41		
10						0·10	0·59	0·27	0·03	0·03		
11						0·08	1·03	0·01	0·26			
12						0·07	0·96		0·26			
13						0·94	0·84			1·48		
14						1·37	1·01	0·04	0·02			
15						0·03	0·44	0·15	0·19			
16						0·92	1·58	0·01	0·61			
17			0·02			1·36	3·92	0·10	0·07			
18						4·24	1·66	0·01	0·04			
19						2·70	1·86	0·01	1·17			
20						0·54	0·14	0·32	0·68			
21						3·06	1·54	0·26	1·11			
22						0·45	2·02	0·16	1·48			
23						0·01		1·18		0·32		
24						0·11	0·17	0·29				
25						0·03	0·70	0·01	0·40			
26						1·52	0·23	0·02				
27						0·01	0·22	0·02	0·02			
28						0·03	0·92	0·11				
29						0·01	0·55	0·30				
30						0·05	0·14	0·12				
31							0·34	0·18				
Monthly Total.			0·02	0·02		19·49	23·73	5·48	6·36	4·42		
No. of rainy days.			1	1		24	29	29	16	6		

Total fall of rain in the year.. 59·52 in.
Total number of rainy days in the year 106
The greatest fall of rain in one month (July) .... 23·73 in.

No rain fell in the months January, February, May, November and December, nor on any of the days left blank in the above table.

Rainfall, 1870.

TABLE XXI.—*Total Fall of Rain, as measured by Osler's Gauge, placed 46 feet above the ground, in each Month and for the whole Year, for each Hour of Bombay Civil Time.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
				in.		in.	in.	in.	in.	in.			in.
12 to 1 A.M.						0·75	0·67	0·18	0·23	0·05			1·88
1 „ 2 „						0·51	1·04	0·08	0·31	0·04			1·98
2 „ 3 „						0·79	0·79	0·67	0·25	0·52			3·02
3 „ 4 „						1·24	0·61	0·21	0·63	0·14			2·83
4 „ 5 „						0·13	0·89	0·05	0·61	0·01			1·69
5 „ 6 „						0·36	0·53	0·07	0·55	0·01			1·52
6 „ 7 „						0·38	0·64	0·43	0·48	0·08			2·01
7 „ 8 „						0·07	0·85	0·52	0·35	0·11			1·90
8 „ 9 „						0·06	0·82	0·08	0·02	0·02			1·00
9 „ 10 „						0·11	0·79	0·23	0·05				1·18
10 „ 11 „						0·17	1·08	0·02					1·27
11 „ 12 „						0·81	1·72	0·22	0·08				2·83
12 to 1 P.M.						0·97	1·42	0·21	0·02				2·62
1 „ 2 „						1·10	0·64	0·09	0·03				1·86
2 „ 3 „						0·39	0·85	0·11					1·35
3 „ 4 „						0·25	1·55	0·04					1·84
4 „ 5 „						0·68	0·77	0·35		0·17			1·97
5 „ 6 „						0·66	0·46	0·14	0·47	0·42			2·15
6 „ 7 „						1·66	0·29	0·08	0·13	0·16			2·32
7 „ 8 „						1·05	0·36	0·08	0·60	1·60			3·69
8 „ 9 „						0·63	0·52	0·04	0·41	0·08			1·68
9 „ 10 „						0·99	0·45	0·23	0·22				1·89
10 „ 11 „						0·37	0·09	0·14	0·11	0·19			0·90
11 to 12 „				0·02		1·06	0·59	0·12	0·10	0·09			1·98

The above Table includes the Rainfall on week-days only.

Mean Daily Velocities of the North and East Components of the Wind, 1870.

TABLE XXII.—*Showing the Mean Velocities of the North or South and East or West Components of the Winds which blew on each Day of the Year* 1870.

In miles per hour.

1870.	MONTH.																							
Date.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
1	7·2 N	0·6 W	4·6 N	2·0 W	4·8 N	1·8 W	12·7 N	6·7 W	9·1 S	6·8 W	4·9 S	9·2 W	6·0 S	18·6 W	7·7 S	18·6 W	0·3 N	17·9 W	6·2 N	4·7 W	8·4 N	2·6 W	6·0 N	1·4 E
2	8·9 N	0·2 E	7·4 N	3·4 W	7·7 N	1·6 W	10·3 N	7·6 W	0·6 N	7·7 W	3·0 S	7·5 W	4·6 S	20·8 W	8·5 S	22·6 W	2·0 N	9·8 W	8·0 N	4·6 W	7·4 N	2·5 W	3·6 N	0·1 W
3	11·0 N	4·5 W	7·4 N	3·5 W	7·0 N	4·5 W	6·8 N	4·6 W	1·1 N	5·1 W	3·1 N	7·9 W	3·0 S	18·4 W	10·3 S	21·0 W	4·0 N	4·2 W	9·9 N	2·9 E	6·4 N	5·0 W	3·9 N	1·2 E
4	14·0 N	4·3 W	4·0 N	2·5 W	0·3 S	3·4 W	5·0 N	5·6 W	5·4 N	10·7 W	2·8 N	7·7 W	3·5 S	15·8 W	9·3 S	18·4 W	2·2 N	3·0 W	3·6 S	2·1 E	6·2 N	2·2 W	0·8 N	1·6 E
5	13·9 N	3·7 W	5·4 N	2·4 W	8·1 N	3·7 W	3·1 S	4·3 W	8·6 N	13·5 W	1·8 S	5·4 W	0·3 N	15·9 W	6·0 S	17·7 W	2·1 N	7·3 W	4·2 N	2·5 W	8·9 N	0·3 E	2·6 N	1·2 E
6	9·8 N	3·5 W	4·2 N	3·0 W	13·1 N	4·6 W	0·9 N	5·3 W	8·5 N	12·3 W	1·1 N	4·4 W	5·8 N	8·8 W	3·7 S	16·0 W	2·1 N	6·0 W	7·2 N	5·1 W	1·1 N	0·1 E	5·3 N	0·5 E
7	9·0 N	3·5 W	4·8 N	1·9 W	0·2 S	5·4 W	3·3 N	4·9 W	1·7 N	7·1 W	3·5 S	5·3 W	0·2 S	0·4 E	11·0 N	10·0 W	2·2 N	2·3 W	6·9 N	5·4 W	16·2 S	6·1 E	4·8 N	0·8 W
8	8·2 N	1·9 W	4·4 N	3·4 W	0·9 S	1·6 W	3·4 N	5·2 W	0·7 N	7·4 W	17·1 S	2·5 W	2·9 S	5·9 W	2·8 N	6·6 W	1·3 N	3·5 W	2·8 N	4·0 W	10·7 S	3·4 E	6·8 N	1·9 E
9	7·7 N	1·1 W	2·9 N	1·2 W	4·3 N	4·2 W	2·6 N	5·1 W	0·6 S	7·5 W	8·7 S	2·1 W	9·9 S	8·9 W	8·4 N	6·7 W	0·1 S	3·3 W	3·2 S	0·3 W	5·6 N	1·3 W	8·9 N	5·8 E
10	7·3 N	2·9 W	6·2 N	4·1 W	7·3 N	5·2 W	0·2 S	5·3 W	1·3 N	8·4 W	10·2 S	5·4 W	15·2 S	8·0 W	9·6 N	6·5 W	2·0 S	7·0 W	1·1 S	1·3 W	5·7 N	2·5 W	8·9 N	5·8 E
11	5·5 N	2·1 W	6·0 N	3·5 W	9·6 N	5·5 W	1·9 N	6·4 W	0·7 S	8·1 W	4·2 S	4·5 W	4·8 S	11·4 W	6·8 N	8·7 N	4·0 S	6·3 W	3·0 N	1·0 E	4·7 N	1·4 W	6·1 N	2·2 E
12	7·8 N	1·9 W	3·2 N	0·9 W	15·7 N	10·9 W	10·3 N	7·1 W	2·3 S	7·7 W	0·5 S	5·1 W	0·7 S	9·6 W	4·6 N	7·7 W	0·2 N	2·3 W	5·2 N	0·7 W	4·3 N	0·3 W		
13	5·8 N	1·4 W	14·3 N	3·4 W	11·2 N	8·6 W	16·4 N	9·2 W	3·4 S	7 7 W	1·3 S	1·2 W	2·0 N	8·3 W	1·5 N	11·7 W	7·9 N	4·0 W	3·9 N	0·9 E	5·9 N	0·1 W	4·4 N	0·9 E
14	4·8 N	1·0 W	11·8 N	2·1 W	6·1 N	6·0 W	12·8 N	9·2 W	1·8 S	7·5 W	0·3 N	0·7 W	2·7 S	15·5 W	0·5 S	23·1 W	9·4 N	5·0 W	6·0 N	2·3 E	5·5 N	0·3 W	3·0 N	2·3 E
15	6·6 N	3·6 W	10·2 N	1·1 E	8·0 N	6·9 W	13·8 N	8·5 W	1·8 S	7·1 W	9·5 S	7·5 E	6·9 S	16·0 W	6·7 S	23·4 W	3·1 N	2·2 W	6·9 N	0·2 W	4·3 N	0·9 E	3·0 N	3·3 E
16	11·1 N	2·2 W	8·6 N	1·0 W			10·0 N	9·0 W	0·8 S	7·5 W	1·2 S	7·9 W	6·9 S	15·2 W	9·4 S	23·6 W	0·4 N	2·0 E	6·7 N	2·7 W	6·5 N	1·8 E	3·4 N	1·0 E
17	13·8 N	4·9 W	8·8 N	5·5 W	6·2 N	0·5 W	2·5 N	6·7 W	1·1 N	8·2 W	8·7 S	9·8 W	3·0 S	19·0 W	8·4 S	21·1 W	5·4 S	4·0 E	6·5 S	1·7 W	7·7 N	0·9 E	6·3 N	1·6 E
18	14·0 N	4·0 W	10·4 N	5·4 W	6·1 N	3·3 W	6·3 N	7·4 W	1·0 N	6·3 W	19·4 S	8·9 W	4·2 S	20·4 W	7·3 S	20·2 W	1·0 N	2·3 W	1·4 N	3·6 W	6·1 N	1·6 E	5·2 N	3·5 E
19	14·1 N	4·9 W	9·5 N	2·0 W	9·5 N	3·0 W	9·8 N	7·5 W	1·4 S	7·9 W	15·9 S	19·5 W	6·2 S	23·4 W	5·6 S	16·9 W	5·6 S	7·8 W	4·0 N	1·0 W	2·5 N	1·4 E	4·2 N	7·2 E
20	14·1 N	5·1 W	7·8 N	2·4 W	12·1 N	5·5 W	2·5 N	7·2 W	3·4 S	8·7 W	18·4 S	21·1 W	9·7 S	21·8 W	1·7 S	16·7 W	9·5 S	10·0 W	7·7 N	1·3 E	4·3 N	1·0 E	4·3 N	0·7 E
21	10·7 N	4·3 W	7·9 N	0·6 E	11·1 N	6·8 W	0·4 N	6·4 W	2·8 S	9·2 W	9·4 S	26·8 W	7·2 S	17·4 W	2·8 S	14·1 W	5·3 S	10·5 E	8·5 N	3·8 E	1·9 N	1·5 E	8·8 N	0·6 E
22	9·2 N	4·3 W	6·2 N	2·3 W	8·0 N	7·0 W	5·8 N	6·3 W	1·4 S	8·3 W	10·1 S	23·8 W	8·5 S	20·5 W	3·7 S	12·7 W	7·4 N	18·3 W	5·8 N	2·1 W	7·2 N	0·1 W	8·7 N	1·0 W
23	5·9 N	0·2 W	7·3 N	5·4 W	4·6 N	5·2 W	2·9 N	6·0 W	2·9 N	8·3 W	12·4 S	15·3 W	7·9 S	19·9 W	4·4 S	14·2 W	4·7 S	10·3 W	4·8 N	1·8 E	4·6 N	1·1 W	6·9 N	1·8 W
24	7·9 N	1·9 W	10·3 N	4·5 W	7·0 N	7·5 W	0·7 N	4·8 W	6·5 N	9·9 W	6·8 S	15·1 W	9·7 S	23·5 W	1·7 S	17·4 W	6·0 S	14·8 W	5·9 N	4·8 E	5·2 N	1·6 W	2·3 N	1·3 E
25	7·2 N	4·0 W	5·1 N	3·3 W	10·6 N	5·9 W	0·3 S	6·5 W	2·1 N	7·5 W	5·0 S	15·0 W	9·1 S	24·3 W	2·6 N	13·6 W	4·0 S	15·2 W	3·8 S	2·5 W	6·4 N	3·3 W	4·3 N	0·8 E
26	9·3 N	3·5 W	5·6 N	0·6 W	11·8 N	7·3 W	2·4 S	7·3 W	2·7 N	7·8 W	7·2 S	10·5 W	9·9 S	23·9 W	3·2 N	10·7 W	3·2 S	14·5 W	5·4 N	3·2 W	3·9 N	3·5 W	1·1 N	2·2 E
27	9·0 N	2·7 W	5·6 N	1·4 W	11·0 N	5·4 W	3·2 S	8·0 W	3·7 N	8·4 W	1·3 S	14·2 W	11·3 S	28·7 W	1·7 N	5·5 W	1·4 N	7·3 W	1·4 N	0·5 W	1·8 N	1·3 E	0·3 N	2·8 E
28	3·7 N	0·2 W	4·2 N	1·1 W	10·7 N	7·4 W	1·3 N	8·7 W	1·7 S	6·5 W	5·1 S	15·4 W	6·3 S	30·2 W	6·4 N	7·2 W	1·0 N	4·7 W	7·2 N	1·9 W	3·8 N	0·4 W	2·1 N	2·2 E
29	2·4 N	1·5 E			9·0 N	7·0 W	5·1 N	6·1 W	8·0 S	8·8 W	6·3 S	13·1 W	7·5 S	22·3 W	7·9 N	14·8 W	2·0 N	2·8 W	7·4 N	3·7 W	1·6 N	0·9 E	8·8 N	2·5 W
30	...	...			9·7 N	7·6 W	1·5 S	5·8 W	6·2 S	11·3 W	8·5 S	12·5 W	8·9 S	19·1 W	1·7 N	20·8 W	5·9 N	3·4 W	7·0 N	2·4 W	2·5 N	1·1 E	10·3 N	2·8 W
31	4·0 N	2·5 W			14·3 N	7·7 W			5·1 S	11·7 W			8·5 S	19·0 W	0·6 S	22·3 W			6·8 N	4·5 W			17·3 N	4·5 W
Monthly Mean. ...	8·8 N	2·6 W	6·9 N	2·5 W	8·1 N	5·4 W	4·6 N	6·6 W	0·1 S	8·4 W	6·4 S	9·7 W	5·7 S	17·1 W	1·3 S	15·2 W	0·2 N	6·0 W	4·2 N	1·2 W	3·8 N	0·2 W	5·4 N	1·3 E
Annual Variation....	6·4 N	3·5 E	4·5 N	3·6 E	5·7 N	0·7 E	2·2 N	0·5 W	2·5 S	2·3 W	8·8 S	3·6 W	8·1 S	11·0 W	3·7 S	9·1 W	2·2 S	0·1 E	1·8 N	4·9 E	1·4 N	5·9 E	3·0 N	7·4 E

The Velocities of the Mean Components for the year are 2·4 N. and 6·1 W.

Diurnal Variation of the Velocity of the North and East Components of the Wind, 1870.

TABLE XXIII.—*Showing the Excess of the Mean Velocities of the North or South and East or West Components of the Winds which blew at each Hour of the Day, above the respective Mean Velocities for the whole Day, in each Month of the Year* 1870.

In miles per hour.

1870.	MONTH.																									
Bombay Civil Time.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Year.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
12 to 1 A.M.	1·6 S	1·8 E	1·2 S	1·9 E	1·5 S	2·7 E	0·1 N	2·3 E	0·1 S	1·7 E	0·3 N	0·6 E	1·1 S	0·7 E	0·9 S	0·2 W	0·6 S	1·1 W	0·8 S	2·3 E	1·8 S	2·6 E	1·6 S	2·6 E	0·9 S	1·5 E
1 ,, 2 ,,	2·5 S	2·7 E	1·6 S	3·0 E	0·9 S	2·7 E	0·3 S	3·3 E	0·1 S	1·3 E	0·5 S	1·3 E	0·5 S	1·2 W	1·5 S	0·8 W	0·4 N	0·5 W	1·1 S	1·7 E	1·4 S	2·5 E	2·5 S	4·0 E	1·0 S	1·7 E
2 ,, 3 ,,	3·0 S	2·7 E	2·1 S	3·5 E	0·2 N	2·6 E	0·9 S	4·8 E	0·1 S	1·9 E	0·7 N	2·6 E	0·4 S	1·0 W	0·9 S	0·4 W	0·2 N	0·3 E	2·1 S	2·0 E	1·3 S	3·0 E	2·3 S	4·3 E	1·0 S	2·2 E
3 ,, 4 ,,	3·0 S	3·2 E	2·0 S	4·3 E	0·1 N	3·8 E	2·2 S	5·7 E	0·0	2·7 E	0·6 S	2·1 E	0·8 N	1·4 W	0·7 S	0·4 W	0·4 N	0·0	2·2 S	2·7 E	0·2 S	4·4 E	1·3 S	5·0 E	0·9 S	2·7 E
4 ,, 5 ,,	2·5 S	4·2 E	1·3 S	4·9 E	0·8 S	5·9 E	1·9 S	6·1 E	0·2 N	2·9 E	0·6 N	3·1 E	0·5 N	0·6 W	1·3 S	0·5 E	1·1 S	1·1 E	2·2 S	3·3 E	0·3 S	4·6 E	0·5 S	5·9 E	0·9 S	3·5 E
5 ,, 6 ,,	2·3 S	4·6 E	1·2 S	5·4 E	1·0 S	6·6 E	1·9 S	6·4 E	0·2 N	3·5 E	0·4 S	4·2 E	0·7 N	0·4 E	1·4 S	0·7 E	2·1 S	2·7 E	2·9 S	4·2 E	0·2 N	4·5 E	0·4 N	5·9 E	1·0 S	4·1 E
6 ,, 7 ,,	2·1 S	5·1 E	1·4 S	5·5 E	1·6 S	8·0 E	2·4 S	6·7 E	0·1 S	4·3 E	0·2 N	5·4 E	0·0	1·8 E	0·1 N	2·1 E	1·7 S	4·6 E	3·0 S	5·1 E	0·4 S	5·4 E	0·5 N	5·8 E	1·0 S	5·0 E
7 ,, 8 ,,	2·8 S	5·8 E	1·2 S	7·2 E	2·8 S	7·3 E	2·2 S	6·7 E	0·2 S	3·8 E	0·2 S	4·6 E	0·6 S	1·1 E	0·5 S	2·3 E	2·3 S	5·1 E	2·5 S	4·9 E	0·4 S	6·9 E	0·5 N	6·7 E	1·3 S	5·2 E
8 ,, 9 ,,	2·8 S	6·8 E	1·7 S	8·4 E	2·1 S	7·6 E	2·6 S	5·4 E	0·3 S	2·0 E	0·0	5·3 E	0·2 S	1·0 E	0·1 N	2·1 E	1·4 S	5·4 E	2·3 S	5·2 E	1·2 S	6·9 E	0·2 N	6·4 E	1·2 S	5·2 E
9 ,, 10 ,,	2·9 S	5·7 E	1·4 S	7·9 E	2·0 S	6·6 E	2·4 S	3·3 E	0·7 S	1·4 E	0·9 S	4·1 E	0·0	2·5 E	0·3 N	2·0 E	2·1 S	4·8 E	2·2 S	4·3 E	1·5 S	6·8 E	0·3 S	6·6 E	1·3 S	4·7 E
10 ,, 11 ,,	2·3 S	2·8 E	2·5 S	5·2 E	2·9 S	2·0 E	2·0 S	0·5 W	0·7 S	0·0	0·9 S	2·0 E	0·1 S	0·6 E	0·5 S	0·5 E	2·4 S	2·6 E	2·1 S	1·4 E	2·8 S	4·2 E	1·9 S	4·2 E	1·8 S	2·1 E
11 ,, 12 ,,	2·0 S	0·7 W	1·7 S	0·6 W	1·7 S	3·0 W	1·3 S	3·8 W	1·0 S	1·3 W	1·0 S	0·2 E	0·1 S	0·1 W	0·0	0·4 E	0·9 S	0·2 W	1·9 S	2·0 W	3·0 S	0·8 E	2·4 S	1·9 E	1·4 S	0·7 W
12 to 1 P.M.	1·1 S	4·1 W	1·2 S	5·0 W	0·5 S	6·2 W	0·2 N	6·1 W	0·8 S	2·7 W	0·4 N	2·6 W	0·6 S	0·0	0·1 N	1·2 W	0·4 S	2·2 W	0·2 S	5·1 W	2·6 S	2·8 W	1·8 S	1·8 W	0·7 S	3·3 W
1 ,, 2 ,,	0·5 N	5·8 W	0·0	7·6 W	0·9 N	8·1 W	1·6 N	7·9 W	0·1 N	4·0 W	0·3 N	4·2 W	1·4 N	0·1 W	0·1 N	1·6 W	0·2 S	4·1 W	1·4 N	8·2 W	1·2 S	7·1 W	1·8 S	4·9 W	0·3 N	5·3 W
2 ,, 3 ,,	1·5 N	7·6 W	0·5 N	9·6 W	2·6 N	9·8 W	2·5 N	8·4 W	0·4 N	5·4 W	0·1 S	5·9 W	1·7 N	1·7 W	0·5 N	2·9 W	1·3 N	5·4 W	3·4 N	8·9 W	0·0	9·1 W	0·5 S	7·0 W	1·1 N	6·8 W
3 ,, 4 ,,	2·7 N	7·3 W	2·3 N	8·9 W	3·2 N	8·6 W	3·0 N	8·2 W	0·9 N	4·7 W	0·7 N	6·3 W	2·0 N	1·1 W	1·1 N	2·2 W	2·3 N	5·2 W	4·6 N	9·4 W	1·6 N	9·2 W	0·4 N	8·9 W	2·1 N	6·7 W
4 ,, 5 ,,	4·4 N	7·6 W	3·3 N	8·9 W	4·2 N	8·1 W	3·9 N	8·1 W	1·1 N	4·9 W	0·1 N	6·6 W	1·4 N	1·9 W	1·8 N	2·0 W	2·9 N	3·9 W	4·9 N	7·6 W	2·6 N	8·3 W	1·2 N	9·8 W	2·6 N	6·5 W
5 ,, 6 ,,	6·0 N	5·6 W	3·7 N	7·5 W	3·6 N	6·6 W	3·2 N	7·1 W	0·7 N	3·4 W	0·1 N	5·7 W	0·8 N	1·2 W	2·0 N	2·1 W	2·8 N	2·8 W	4·5 N	3·9 W	3·3 N	6·7 W	2·4 N	8·9 W	2·8 N	5·1 W
6 ,, 7 ,,	6·4 N	4·7 W	4·5 N	6·1 W	3·5 N	4·0 W	3·0 N	4·4 W	0·3 N	1·8 W	1·2 N	3·9 W	0·0	0·0	1·2 N	0·1 W	1·4 N	1·9 W	4·2 N	2·6 W	4·0 N	5·6 W	3·6 N	7·8 W	2·8 N	3·6 W
7 ,, 8 ,,	5·9 N	3·9 W	4·3 N	4·3 W	2·3 N	2·8 W	1·2 N	1·6 W	0·0	0·7 W	0·1 S	1·7 W	0·0	0·3 W	1·8 N	0·5 E	1·1 N	0·5 W	1·9 N	1·2 E	3·5 N	4·5 W	3·7 N	6·5 W	2·1 N	2·1 W
8 ,, 9 ,,	3·4 N	1·8 W	2·9 N	2·3 W	1·3 N	1·4 W	0·5 N	0·6 E	0·4 N	0·8 E	0·2 S	0·7 W	0·2 S	0·8 E	0·8 N	1·4 E	1·3 N	0·1 W	0·6 N	1·5 E	2·2 N	1·8 W	3·1 N	4·1 W	1·3 N	0·6 W
9 ,, 10 ,,	0·7 N	0·0	1·0 N	0·0	0·5 S	0·2 E	0·0	1·1 E	0·1 S	0·3 E	0·0	0·8 E	1·8 S	0·7 E	0·6 S	0·8 E	0·7 N	0·2 E	0·8 N	2·3 E	0·9 N	0·3 W	1·8 N	1·7 W	0·2 N	0·4 E
10 ,, 11 ,,	0·2 S	1·5 E	0·7 S	0·8 E	1·3 S	1·3 E	0·1 S	1·6 E	0·2 S	1·0 E	0·3 S	0·6 E	1·7 S	0·7 E	0·1 S	0·9 E	0·1 N	1·0 E	0·4 N	2·7 E	0·6 S	0·8 E	0·1 S	0·3 E	0·4 S	1·1 E
11 ,, 12 ,,	1·0 S	1·6 E	0·7 S	1·8 E	1·1 S	1·8 E	0·1 N	2·4 E	0·0	1·0 E	0·4 S	1·5 E	1·9 S	0·3 E	0·8 S	0·1 E	0·1 S	0·2 E	0·2 S	2·5 E	0·8 S	1·7 E	1·1 S	1·4 E	0·7 S	1·4 E

Velocity of Wind, 1870.

TABLE XXIV.—*Mean Velocity of the Wind, in miles per hour, without regard to the direction from which it blew, for each Day of Bombay Civil Time: also the Mean Monthly Velocity, and its Variation from the Mean of the Year.*

1870.	MONTH.											
Date.	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
1	9·4	7·1	7·7	15·9	13·2	10·7	19·9	20·2	18·0	9·3	10·3	9·1
2	10·7	9·2	10·2	14·4	8·2	9·0	21·7	24·3	10·2	10·2	9·5	7·0
3	12·4	8·8	10·9	8·9	5·4	8·7	19·0	23·6	8·0	14·3	9·3	7·0
4	15·2	6·7	8·5	9·0	12·1	8·3	17·1	20·9	6·4	8·1	9·1	6·4
5	14·7	8·3	11·2	9·3	16·3	10·0	16·0	18·8	7·8	9·2	12·0	7·1
6	11·0	6·8	15·4	6·2	15·2	9·7	12·7	16·7	6·5	9·2	7·2	9·2
7	10·4	7·9	8·4	7·8	7·8	9·3	7·0	10·6	7·3	9·5	17·7	7·0
8	9·5	7·8	7·0	6·5	7·5	19·2	11·0	8·5	7·9	6·1	12·7	9·8
9	9·9	7·5	7·9	8·2	7·6	12·8	14·6	12·0	6·8	5·8	8·3	12·5
10	9·2	10·5	10·0	7·8	8·8	14·2	18·2	12·0	7·6	6·9	7·4	12·8
11	8·9	8·9	13·4	7·5	8·3	10·2	13·8	11·3	9·7	7·0	6·5	10·3
12	9·7	9·6	20·0	13·3	8·3	6·1	11·7	9·3	8·0	8·2	6·6	...
13	8·8	16·4	15·3	19·9	8·5	8·3	11·1	12·0	10·6	8·6	7·8	7·0
14	7·7	13·3	10·5	16·4	7·9	9·7	16·3	23·2	11·8	11·7	7·1	7·7
15	9·2	12·7	10·8	16·8	7·7	17·0	17·5	24·8	7·0	9·0	7·4	10·4
16	12·2	10·4	...	13·9	7·7	13·2	17·1	25·5	8·8	8·4	10·1	8·4
17	15·2	10·9	7·8	7·5	8·7	18·3	20·0	22·7	9·6	8·6	10·5	8·9
18	15·0	12·4	9·0	10·9	6·9	23·0	21·2	21·6	10·7	5·4	8·5	8·7
19	15·2	10·8	11·5	13·6	8·2	26·5	24·7	18·0	14·2	9·1	8·2	12·2
20	15·5	11·1	13·8	12·9	9·4	28·3	24·0	17·8	15·7	11·1	8·4	7·6
21	11·9	12·2	13·7	9·3	9·8	30·0	19·3	14·6	20·6	11·2	6·5	12·0
22	10·5	9·0	13·0	10·1	8·6	26·3	22·3	14·1	20·3	10·5	11·0	9·9
23	9·0	10·4	9·0	7·7	9·1	20·0	21·5	15·1	11·7	8·8	7·7	8·1
24	11·1	12·0	11·3	6·7	12·3	16·4	25·5	18·0	16·2	8·1	7·6	7·0
25	8·6	8·5	14·0	6·7	8·7	16·0	26·1	14·1	16·0	6·5	7·9	7·5
26	10·5	8·5	14·5	8·0	8·9	13·9	25·9	11·4	15·2	7·3	6·1	6·2
27	10·0	8·5	13·5	8·8	9·4	14·5	30·9	8·0	8·2	7·3	6·5	7·5
28	5·9	8·4	13·6	9·1	8·2	16·5	31·5	11·0	5·4	9·5	7·0	7·0
29	7·3		12·5	9·0	12·4	14·7	23·8	17·2	6·4	9·9	7·0	10·6
30	...		13·8	9·3	13·0	16·5	21·2	21·2	8·5	9·1	9·2	11·9
31	6·6		17·3		12·8		21·0	22·5		8·6		18·2
Monthly Mean.	10·7	9·8	11·8	10·4	9·6	15·2	19·5	16·8	10·7	8·8	8·7	9·2
Annual Variation.	− 1·1	− 2·0	0·0	− 1·4	− 2·2	+ 3·4	+ 7·7	+ 5·0	− 1·1	− 3·0	− 3·1	− 2·6

	Miles.
The Mean Velocity for June to August	17·2
The Mean Velocity for September to May	10·0
The Mean Velocity for the Year	11·8
The greatest monthly mean (that of July)	19·5
The least monthly mean (that of November)	8·7
Difference	10·8

Velocity of Wind, 1870.

Table XXV.—*The Mean Diurnal Variation of the Velocity of the Wind, in miles per hour, for each Month and for the whole Year; or the Excess of the Mean Hourly Velocity above the respective Monthly and Annual Means.*

1870. Bombay Civil Time.	MONTH.												Year.
	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
12 to 1 A.M.	– 2·9	– 3·5	– 3·6	– 2·4	– 1·6	– 1·2	– 0·7	– 0·1	– 0·7	– 2·0	– 2·5	– 2·0	– 1·9
1 „ 2 „	– 3·7	– 3·0	– 3·6	– 3·1	– 1·2	– 0·6	+ 0·8	+ 0·6	– 1·4	– 2·8	– 2·8	– 1·5	– 1·9
2 „ 3 „	– 4·4	– 3·5	– 2·3	– 4·0	– 1·9	– 1·0	+ 0·9	+ 0·3	– 1·6	– 2·7	– 2·2	– 1·5	– 2·0
3 „ 4 „	– 3·9	– 3·3	– 2·0	– 4·7	– 2·5	– 0·6	+ 0·8	+ 0·6	– 1·9	– 2·6	– 1·2	– 0·6	– 1·8
4 „ 5 „	– 3·1	– 2·3	– 2·8	– 4·3	– 3·1	– 2·5	+ 0·1	– 0·5	– 1·3	– 2·3	– 1·1	+ 0·7	– 1·9
5 „ 6 „	– 3·1	– 1·9	– 2·9	– 4·7	– 3·7	– 1·0	+ 0·3	– 0·6	– 1·1	– 2·6	– 0·7	+ 0·8	– 1·8
6 „ 7 „	– 2·9	– 2·5	– 3·2	– 5·4	– 4·2	– 1·5	– 0·4	– 2·0	+ 0·5	– 1·8	– 0·1	+ 0·9	– 1·9
7 „ 8 „	– 3·0	– 1·8	– 4·0	– 3·9	– 3·0	– 1·1	+ 0·3	– 1·8	+ 1·0	– 2·1	+ 0·7	+ 1·6	– 1·4
8 „ 9 „	– 2·4	– 1·4	– 2·8	– 3·0	– 1·5	– 1·8	– 0·2	– 1·1	+ 0·3	– 2·6	+ 0·4	+ 1·2	– 1·2
9 „ 10 „	– 2·6	– 1·2	– 2·2	– 2·2	– 0·3	– 1·4	– 2·2	– 1·9	– 0·3	– 3·3	+ 0·6	+ 1·3	– 1·3
10 „ 11 „	– 2·5	– 2·7	– 2·0	– 0·9	+ 0·5	– 1·4	– 1·0	– 0·9	– 0·8	– 3·3	– 1·8	– 1·2	– 1·5
11 „ 12 „	– 1·7	– 1·7	+ 0·3	+ 1·7	+ 1·5	– 0·3	0·0	– 0·3	0·0	– 1·9	– 1·6	– 2·8	– 0·6
12 „ 1 P.M.	+ 0·3	+ 0·2	+ 2·7	+ 4·3	+ 2·7	+ 0·3	+ 0·2	+ 0·9	+ 1·0	+ 1·3	– 0·7	– 2·0	+ 0·9
1 „ 2 „	+ 2·4	+ 2·8	+ 5·1	+ 6·3	+ 3·7	+ 1·4	– 0·1	+ 1·4	+ 2·1	+ 4·3	+ 1·6	– 1·5	+ 2·5
2 „ 3 „	+ 3·9	+ 4·8	+ 7·4	+ 7·4	+ 4·9	+ 3·1	+ 0·7	+ 2·8	+ 3·7	+ 5·4	+ 3·2	+ 0·5	+ 4·0
3 „ 4 „	+ 5·2	+ 5·5	+ 6·7	+ 7·3	+ 4·2	+ 3·0	+ 0·1	+ 2·3	+ 3·4	+ 6·0	+ 4·2	+ 1·6	+ 4·1
4 „ 5 „	+ 6·7	+ 6·3	+ 7·0	+ 7·6	+ 4·7	+ 4·0	+ 0·8	+ 1·9	+ 2·5	+ 5·2	+ 3·8	+ 2·2	+ 4·4
5 „ 6 „	+ 6·7	+ 5·4	+ 5·7	+ 6·1	+ 3·0	+ 2·6	+ 0·4	+ 1·8	+ 1·7	+ 6·0	+ 3·1	+ 2·4	+ 3·8
6 „ 7 „	+ 6·4	+ 4·9	+ 3·4	+ 4·0	+ 1·3	+ 2·1	– 0·5	+ 0·3	– 0·3	+ 3·6	+ 2·8	+ 2·4	+ 2·5
7 „ 8 „	+ 5·6	+ 3·7	+ 1·7	+ 0·6	+ 0·1	+ 1·1	– 0·5	– 0·5	– 0·4	+ 2·4	+ 1·7	+ 1·8	+ 1·4
8 „ 9 „	+ 2·6	+ 1·5	+ 0·3	– 1·2	– 1·0	+ 0·4	– 0·6	– 1·4	– 1·1	+ 0·4	– 0·2	+ 0·3	0·0
9 „ 10 „	– 0·3	– 0·7	– 1·9	– 1·9	– 0·6	– 0·7	+ 0·5	– 0·5	– 2·0	– 0·8	– 1·8	– 1·3	– 1·0
10 „ 11 „	– 1·2	– 2·6	– 3·1	– 2·0	– 1·3	– 1·1	– 0·2	– 1·0	– 2·1	– 1·4	– 2·6	– 2·2	– 1·7
11 „ 12 „	– 2·1	– 2·6	– 3·1	– 2·0	– 1·0	– 0·8	– 0·1	– 0·3	– 1·4	– 2·3	– 2·7	– 2·0	– 1·7

	Miles.
The Mean Velocity of the Wind for the hours from 10 P.M. to 10 A.M.	10·1
The Mean Velocity of the Wind for the hours from 10 A.M. to 10 P.M.	13·5
The Mean Velocity for 24 hours	11·8

In the Mean Diurnal Variation for the year a Maximum occurs about 4 P.M., and a Minimum about 2 A.M.

Aggregate and Mean Velocities and Relative Frequency of Different Winds, 1870.

TABLE XXVI.—*Showing, for the year* 1870, *the Sums of the Velocities, and the Mean Velocities, in miles per hour, of the Winds which blew in each Month, from each of the Sixteen Principal Directions: and also the number of Observations which those sums comprise; the latter numbers indicating the Relative Frequency of the same Wind (as to direction) in the several Months, and of different Winds during the same Month.*

1870.	N.			NNE.			NE.			ENE.			E.			ESE.			SE.			SSE.		
Months.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January......	1437	182	7·9	304	48	6·3	472	60	7·9	200	28	7·1	95	17	5·6	66	11	6·0	2	1	2·0	...	...	...
February ...	828	111	7·5	343	53	6·5	672	75	9·0	290	36	8·1	154	30	5·1	54	6	9·0	...	...	...	...	...	...
March	735	90	8·2	371	59	6·3	324	36	9·0	162	19	8·5	55	8	6·9	78	9	8·7	2	1	2·0	6	1	6·0
April	334	50	6·7	122	20	6·1	95	14	6·8	49	11	4·5	27	5	5·4	69	11	6·3	30	4	7·5	10	3	3·3
May	11	2	5·5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	1	14·0	...	...	...
June	...	...	...	39	4	9·7	103	10	10·3	39	6	6·5	141	13	10·8	337	33	10·2	182	17	10·7	201	13	15·5
July	23	4	5·7	16	3	5·3	10	2	5·0	14	2	7·0	6	1	6·0	62	8	7·7	51	5	10·2	10	2	5·0
August	46	7	6·6	28	5	5·6	6	2	3·0	24	4	6·0	8	3	2·7	...	...	...	20	3	6·7	...	...	...
September ...	71	14	5·1	76	12	6·3	104	12	8·7	122	16	7·6	90	13	6·9	481	42	11·5	320	25	12·8	96	12	8·0
October	260	38	6·8	346	54	6·4	753	94	8·0	446	50	8·9	190	28	6·8	198	24	8·2	109	17	6·4	153	17	9·0
November ...	292	49	6·0	291	54	5·4	886	102	8·7	552	78	7·1	226	40	5·6	172	23	7·5	180	15	12·0	388	21	18·5
December ...	696	91	7·6	337	57	5·9	1219	127	9·6	1081	113	9·6	356	43	8·3	228	22	10·4	59	9	6·6	14	2	7·0
Year.. ...	4733	638	7·4	2273	369	6·2	4644	534	8·7	2979	363	8·2	1348	201	6·7	1745	189	9·2	969	98	9·9	878	71	12·4

[*Continued.*

1870	S.			SSW.			SW.			WSW.			W.			WNW.			NW.			NNW.		
Months.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.	Sums of Velocities.	Number of Observations.	Mean Velocity.
	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.	Miles.		Miles.
January	5	1	5·0	...	...	...	...	...	...	5	1	5·0	55	7	7·9	285	27	10·6	1545	112	13·8	3237	223	14·5
February ...	...	...	...	...	...	...	...	...	...	6	1	6·0	77	8	9·6	990	89	11·1	1722	143	12·0	1432	115	12·5
March	34	4	8·5	24	3	8·0	32	4	8·0	112	14	8·0	93	10	9·3	993	79	12·6	3879	245	15·8	1609	133	12·1
April	106	8	13·2	91	12	7·6	124	22	5·6	585	73	8·0	703	66	10·7	1656	156	10·6	2473	172	14·4	992	89	11·1
May	71	5	14·2	163	12	13·6	390	39	10·0	2154	232	9·3	1777	218	8·2	1740	149	11·7	777	81	9·6	35	5	7·0
June	634	34	18·6	717	44	16·3	2345	127	18·5	4302	258	16·7	1240	92	13·5	585	52	11·2	36	7	5·1	43	8	5·4
July	224	13	17·2	268	17	15·8	682	49	13·9	9377	421	22·3	3043	159	19·1	414	29	14·3	275	26	10·6	13	3	4·3
August	...	...	...	36	4	9·0	223	13	17·2	5870	284	20·7	3522	200	17·6	1615	129	12·5	972	74	13·1	131	15	8·7
September ...	215	19	11·3	181	15	12·1	159	17	9·4	1538	114	13·5	1521	128	11·9	1609	159	10·1	828	90	9·2	281	29	9·7
October	192	25	7·7	58	10	5·8	83	11	7·5	157	31	5·1	103	13	7·9	508	52	9·8	1763	148	11·9	1200	125	9·6
November ...	129	9	14·3	84	7	12·0	...	...	...	...	...	...	151	20	7·5	625	70	8·9	1299	119	10·9	967	104	9·3
December ...	6	2	3·0	...	...	...	...	...	...	21	3	7·0	198	29	6·8	507	63	8·0	841	84	10·0	1017	70	14·5
Year......	1616	120	13·5	1622	124	13·1	4038	282	14·3	24127	1432	16·8	12483	950	13·1	11527	1054	10·9	16410	1301	12·6	10957	919	11·9

PLATE II.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1865.

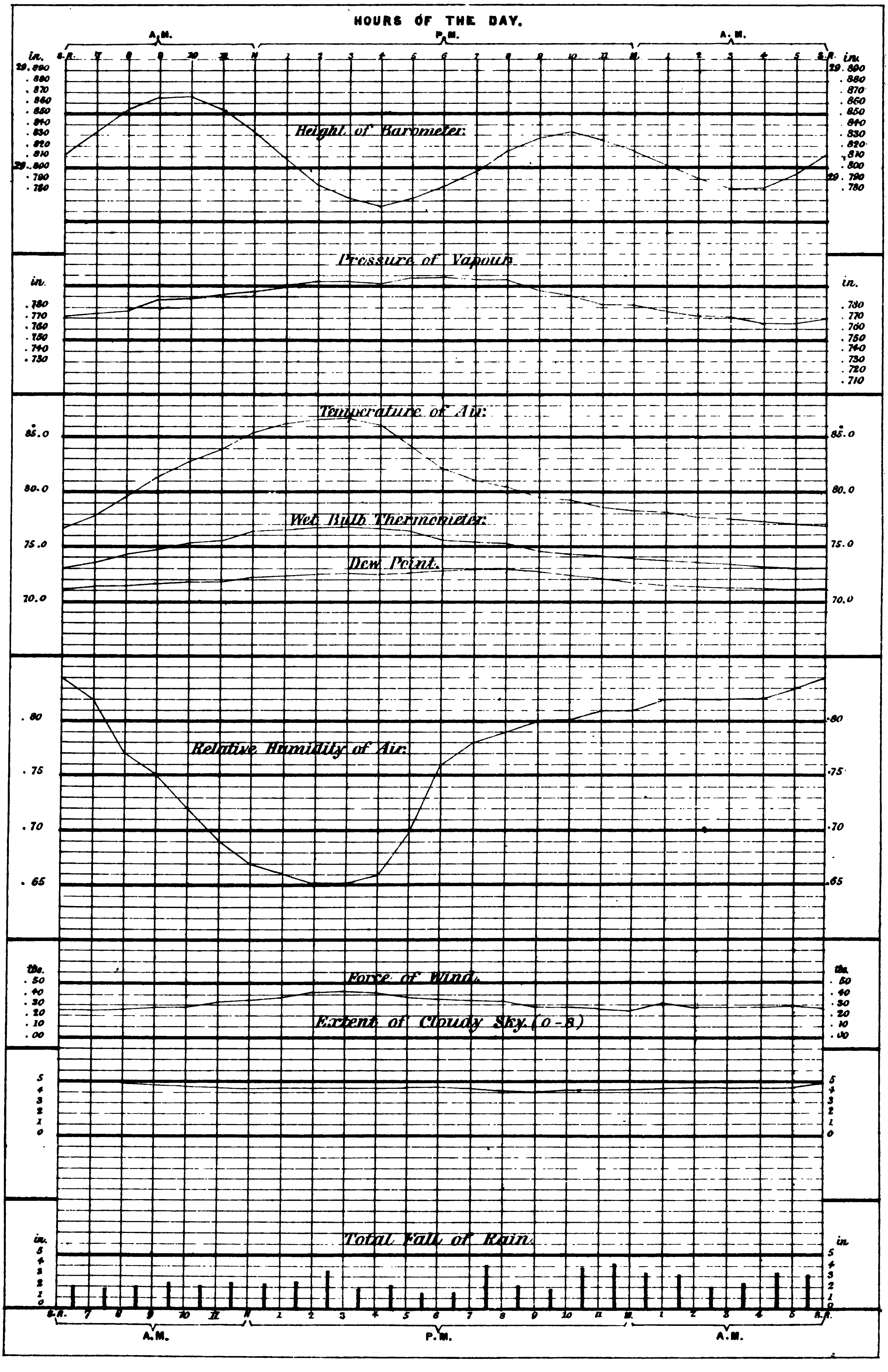
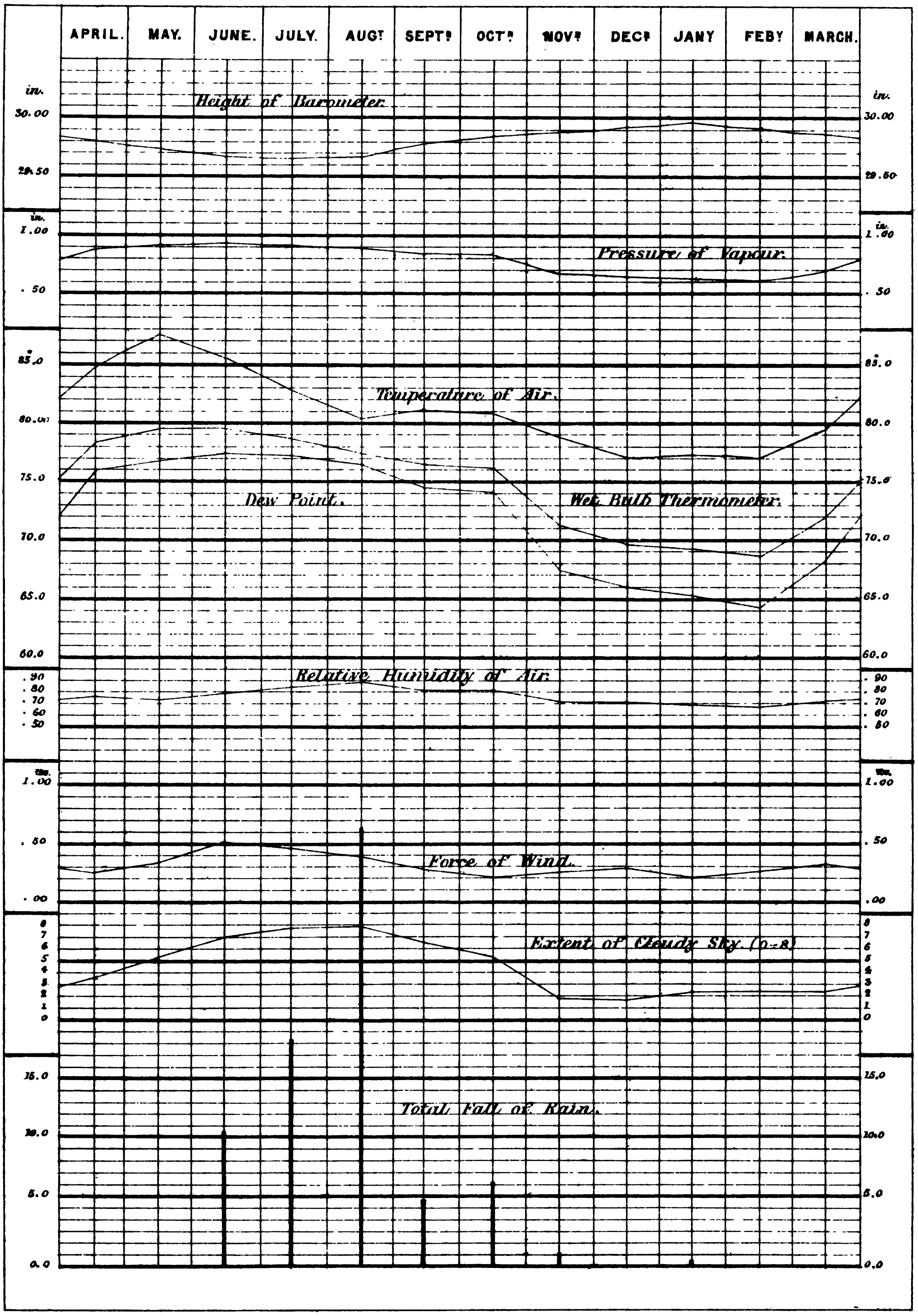


PLATE III.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS.

1865.



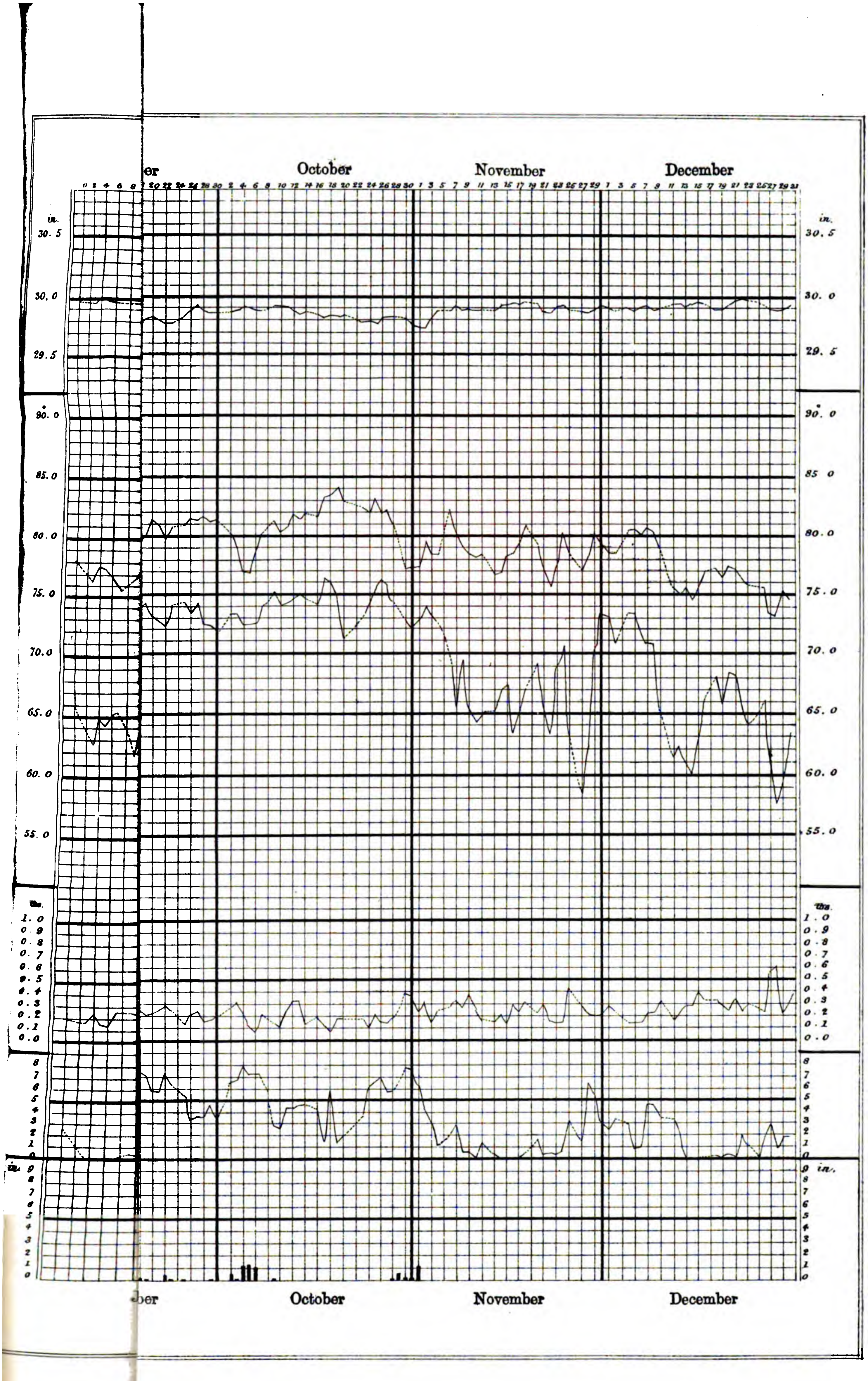

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PLATE V.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1866.

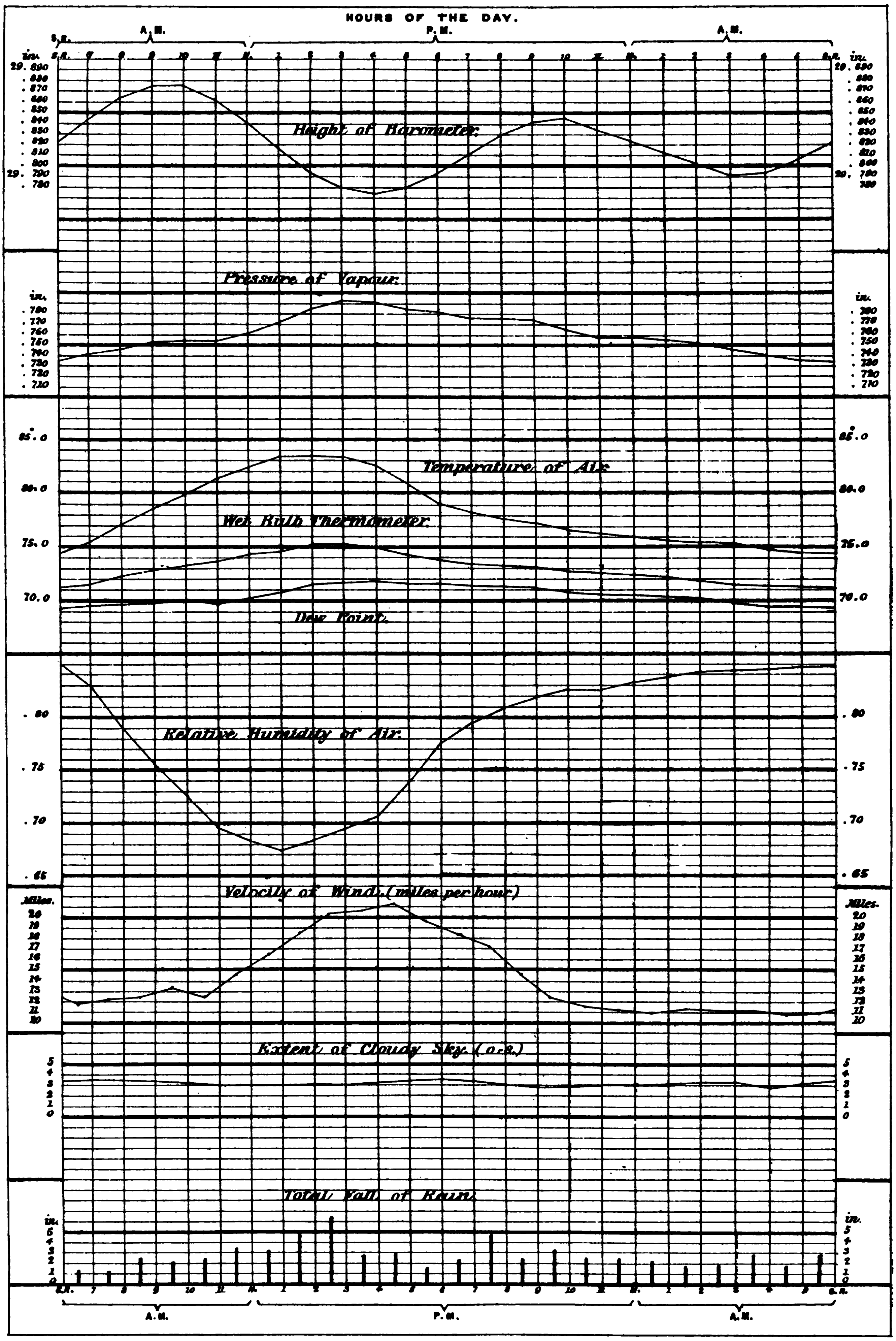
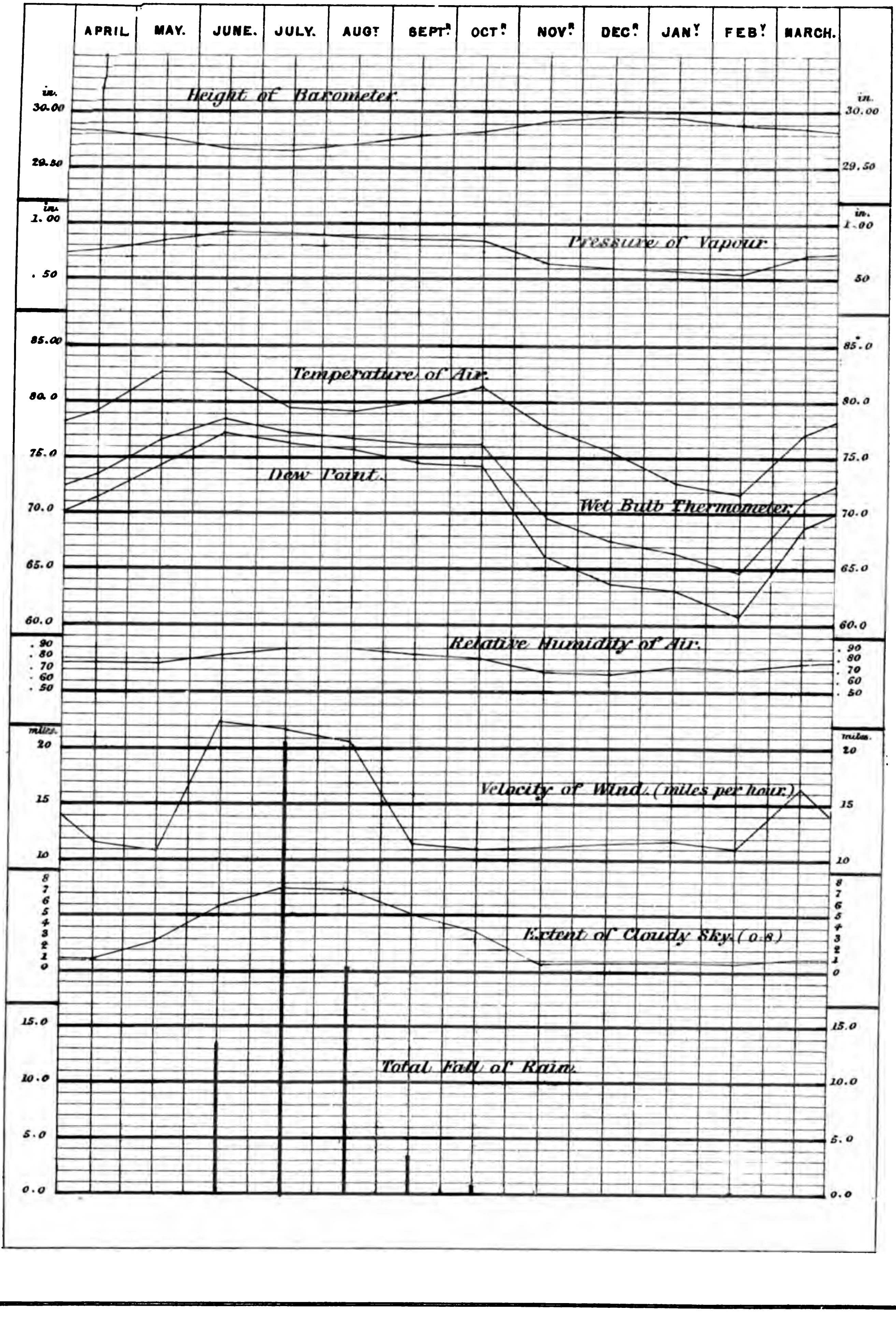


PLATE VI.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS. 1866.



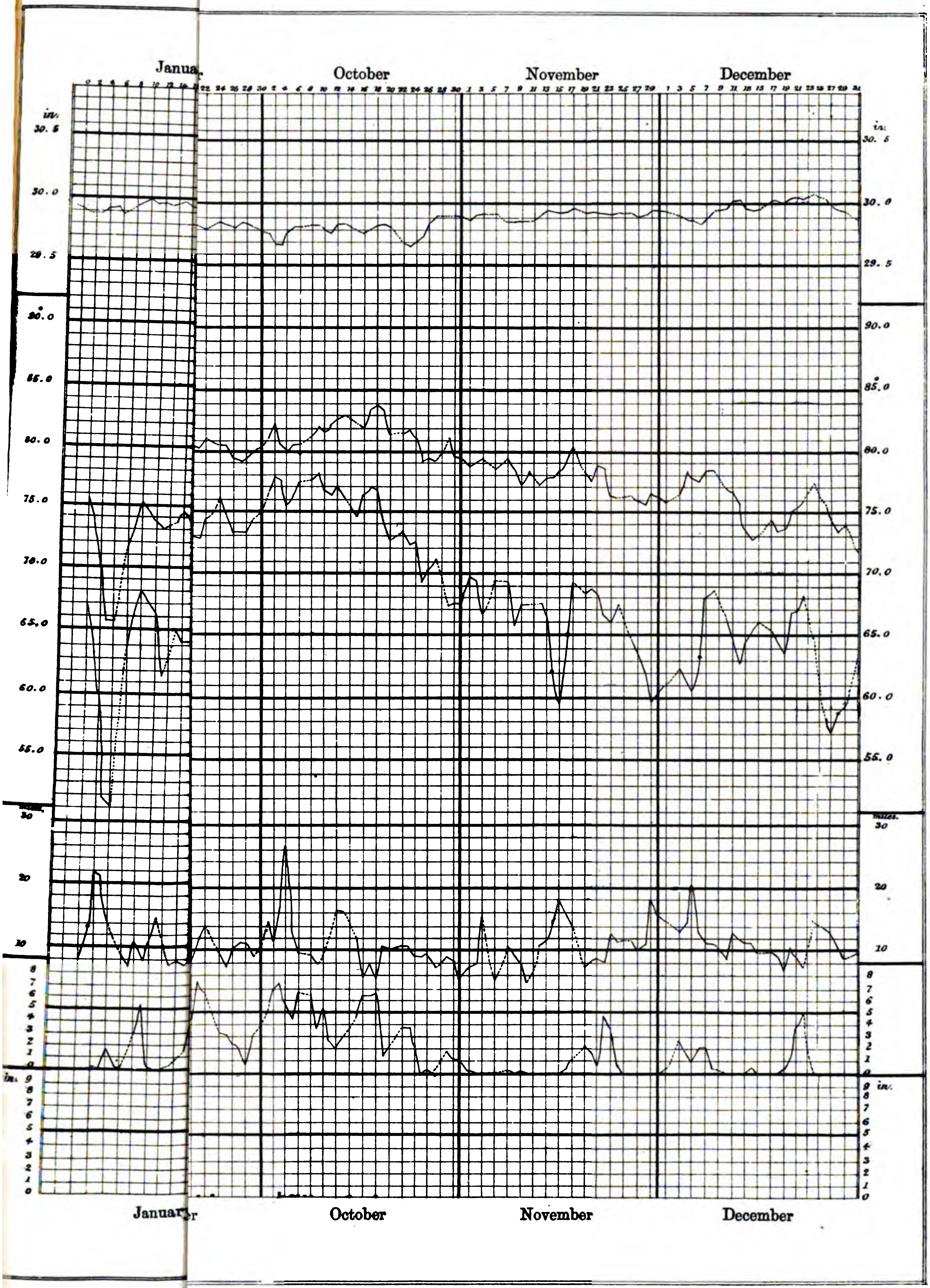

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PLATE VIII.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1867.

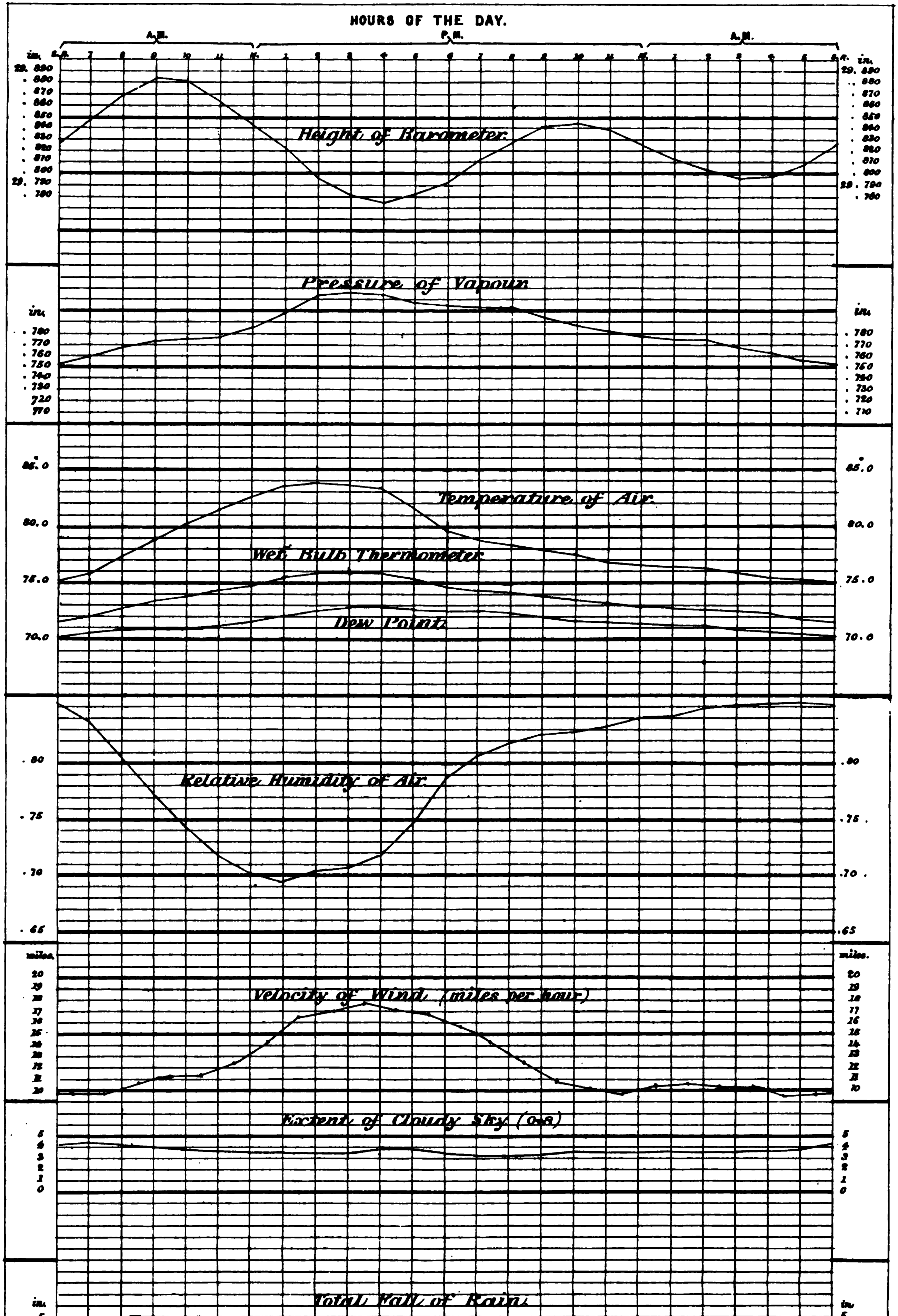
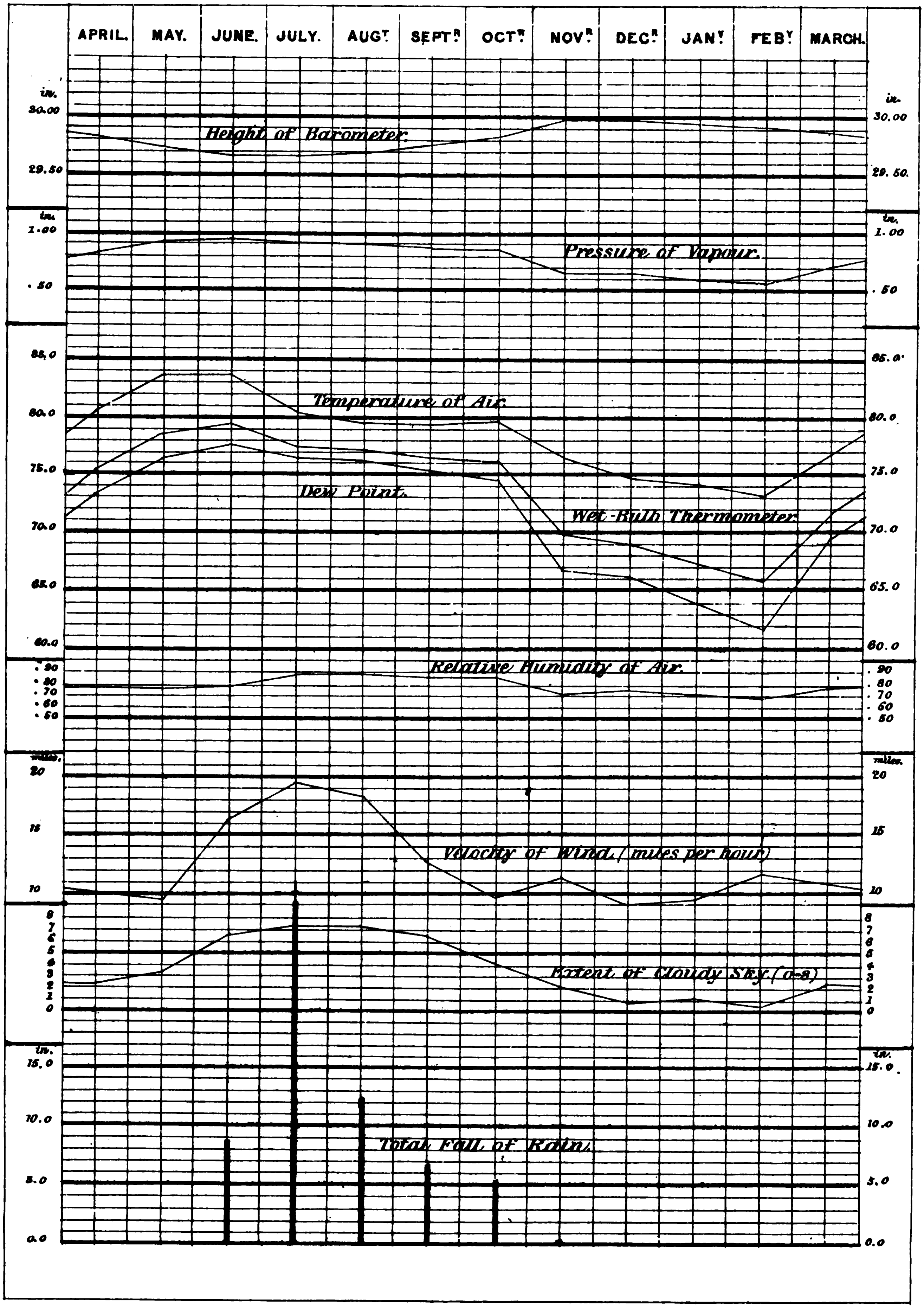


PLATE. IX.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS.
1867.



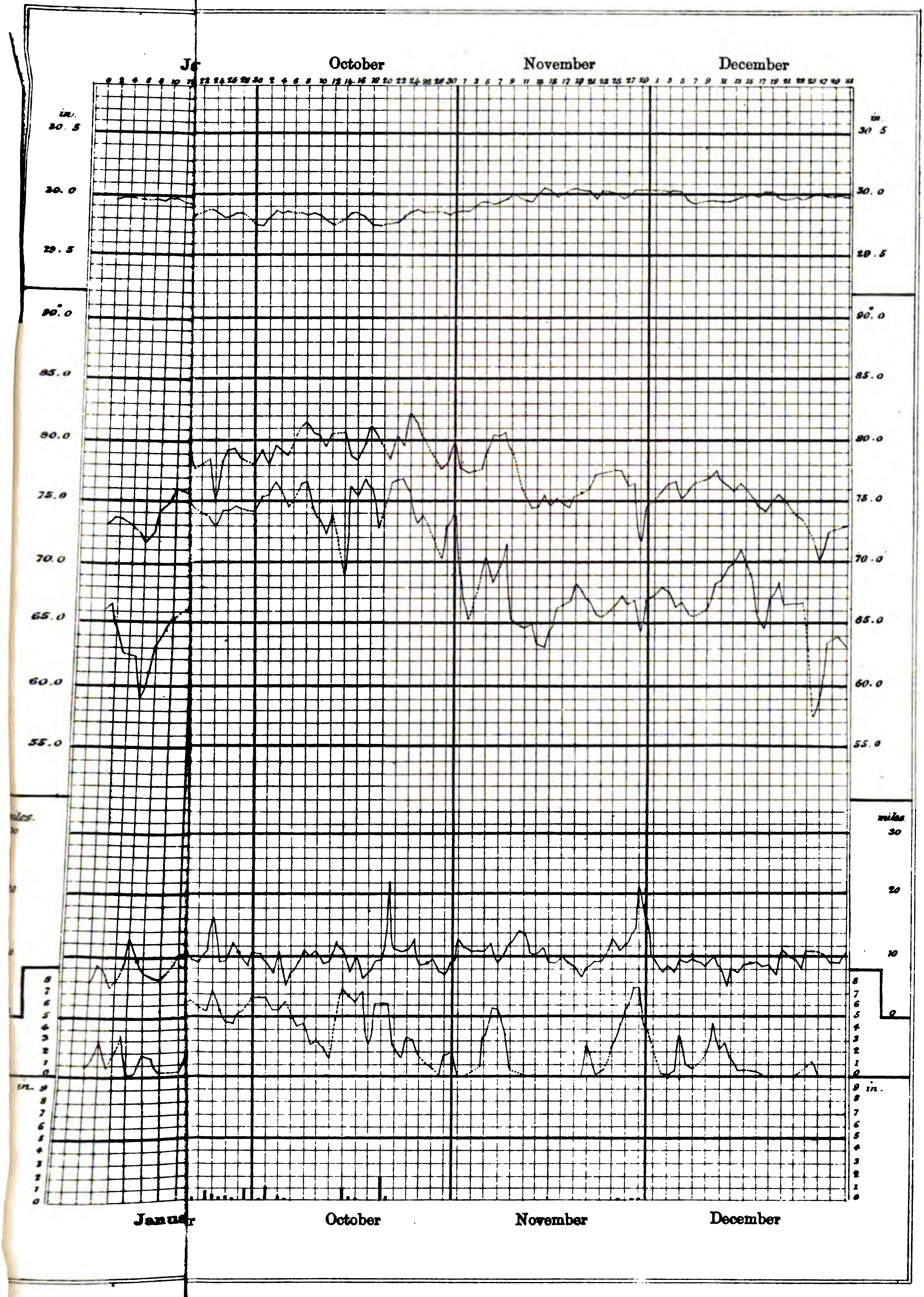


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PLATE XI.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1868.

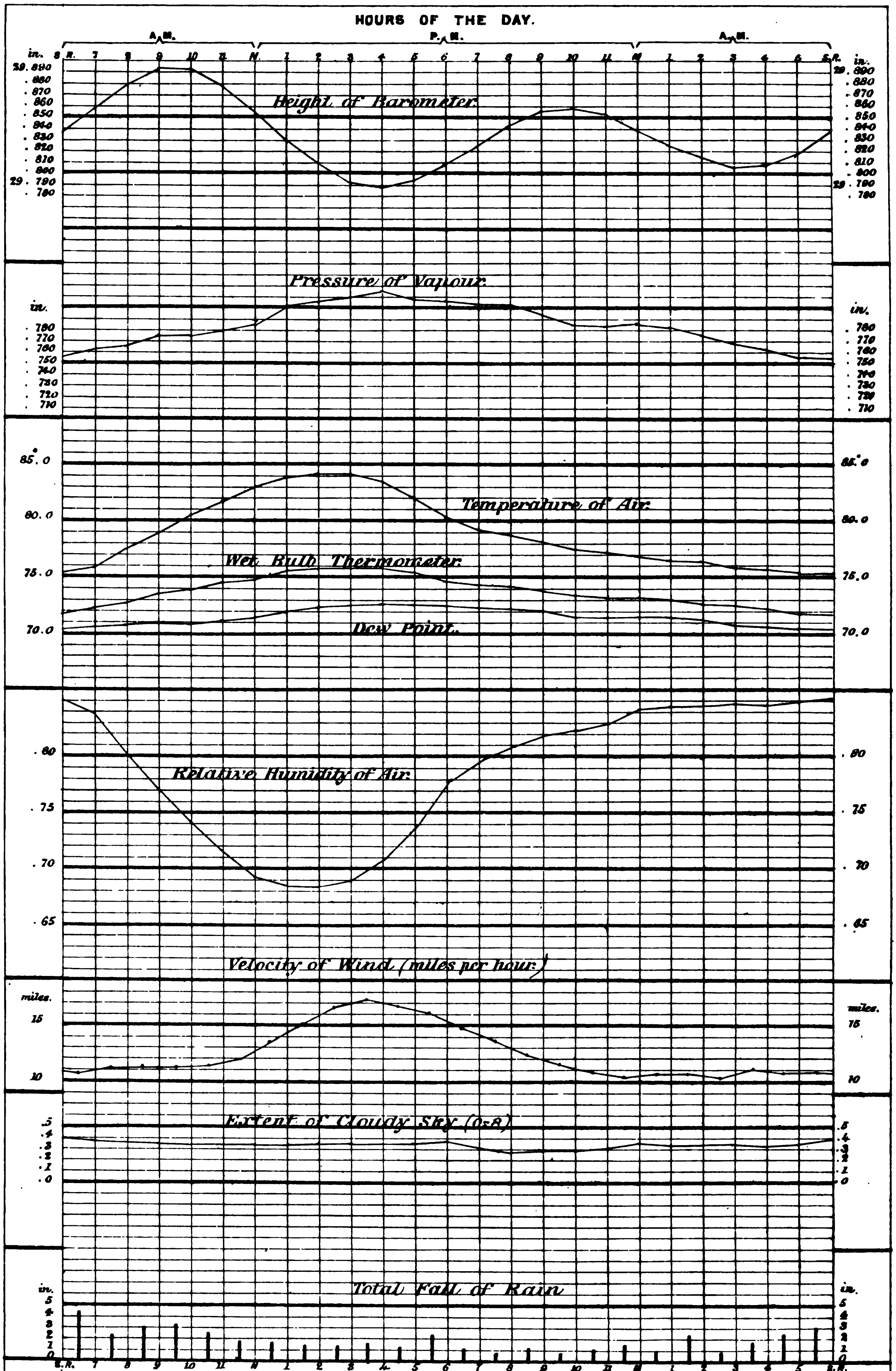
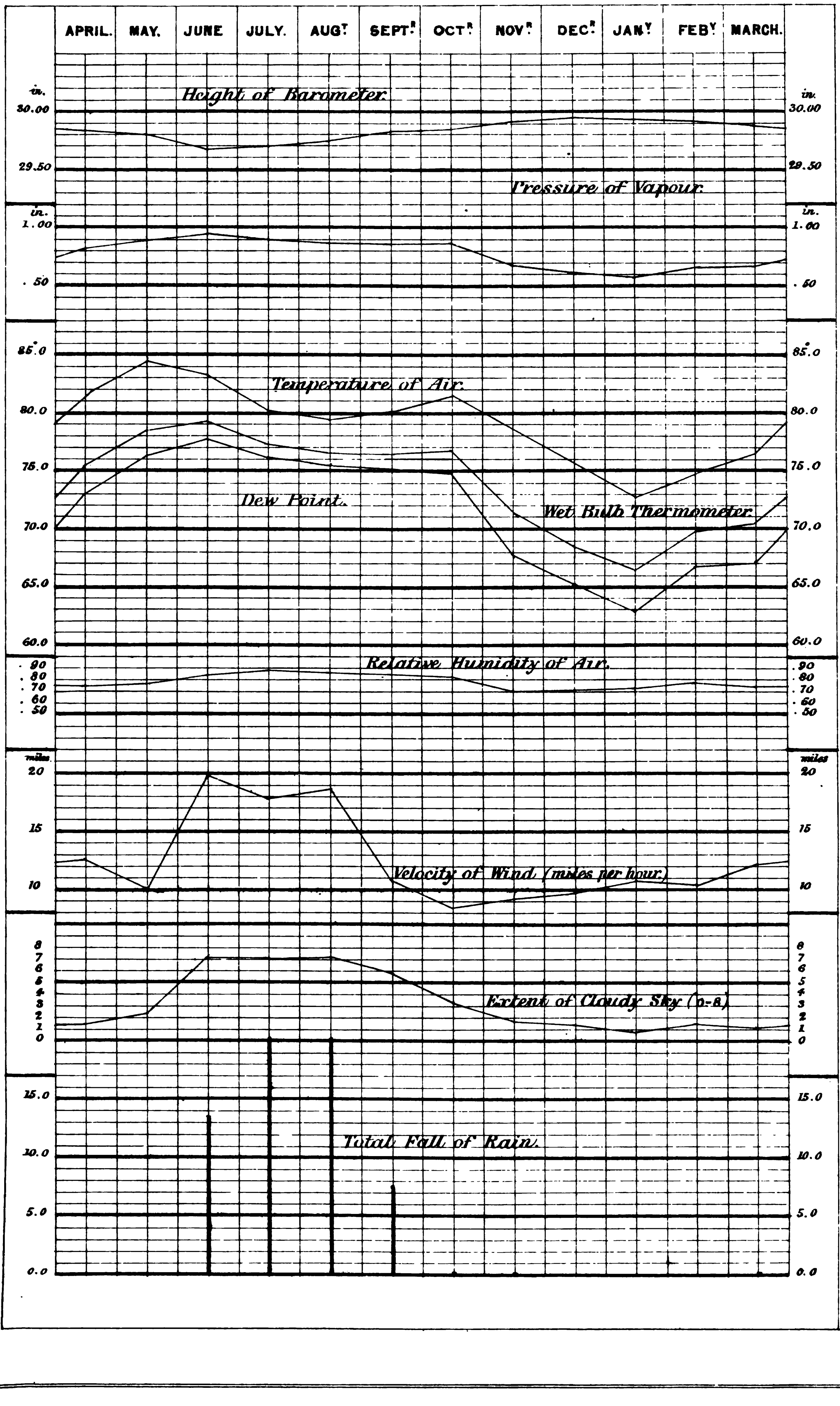


PLATE XII.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS.

1868.



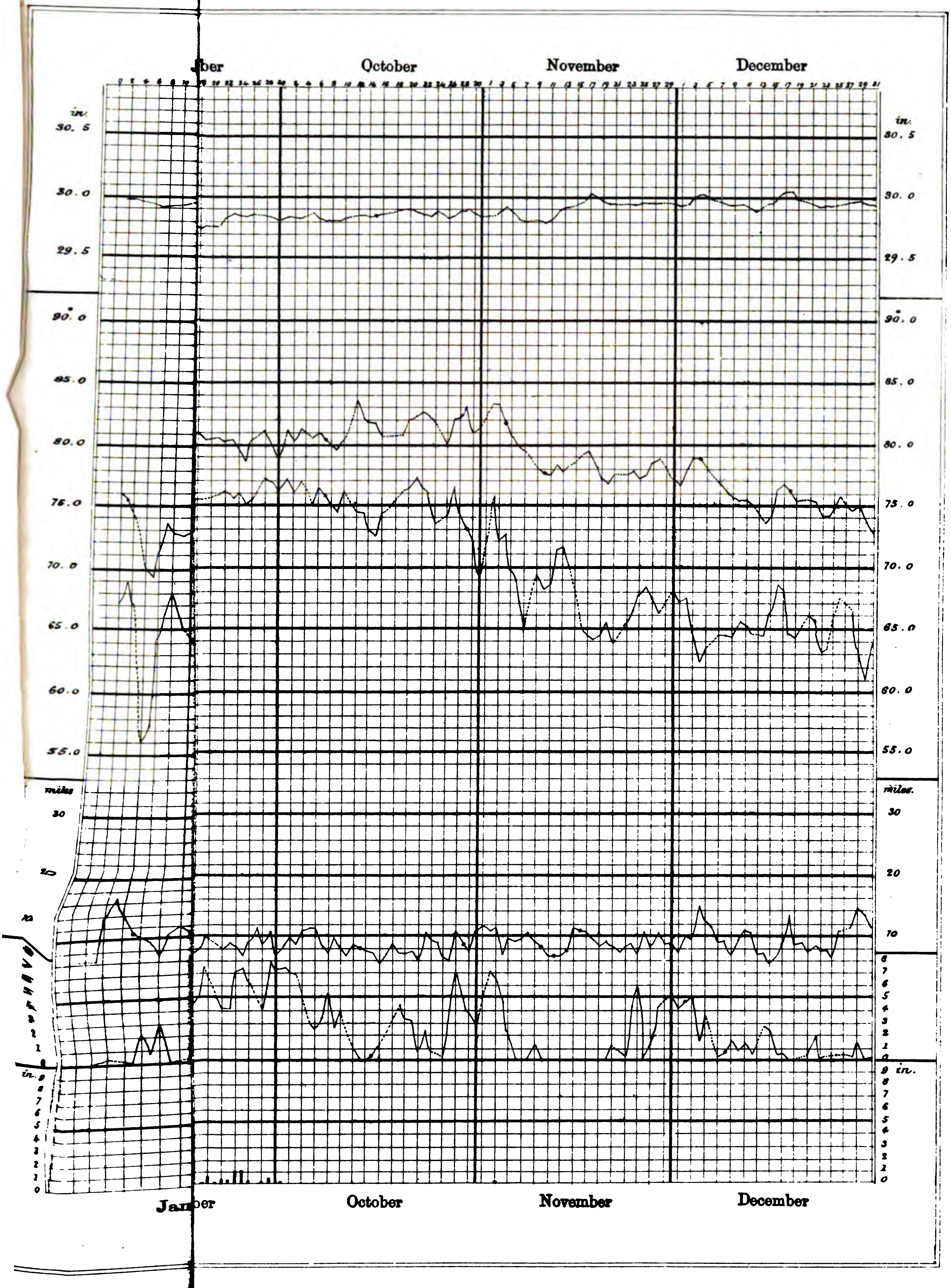

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PLATE XIV.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1869.

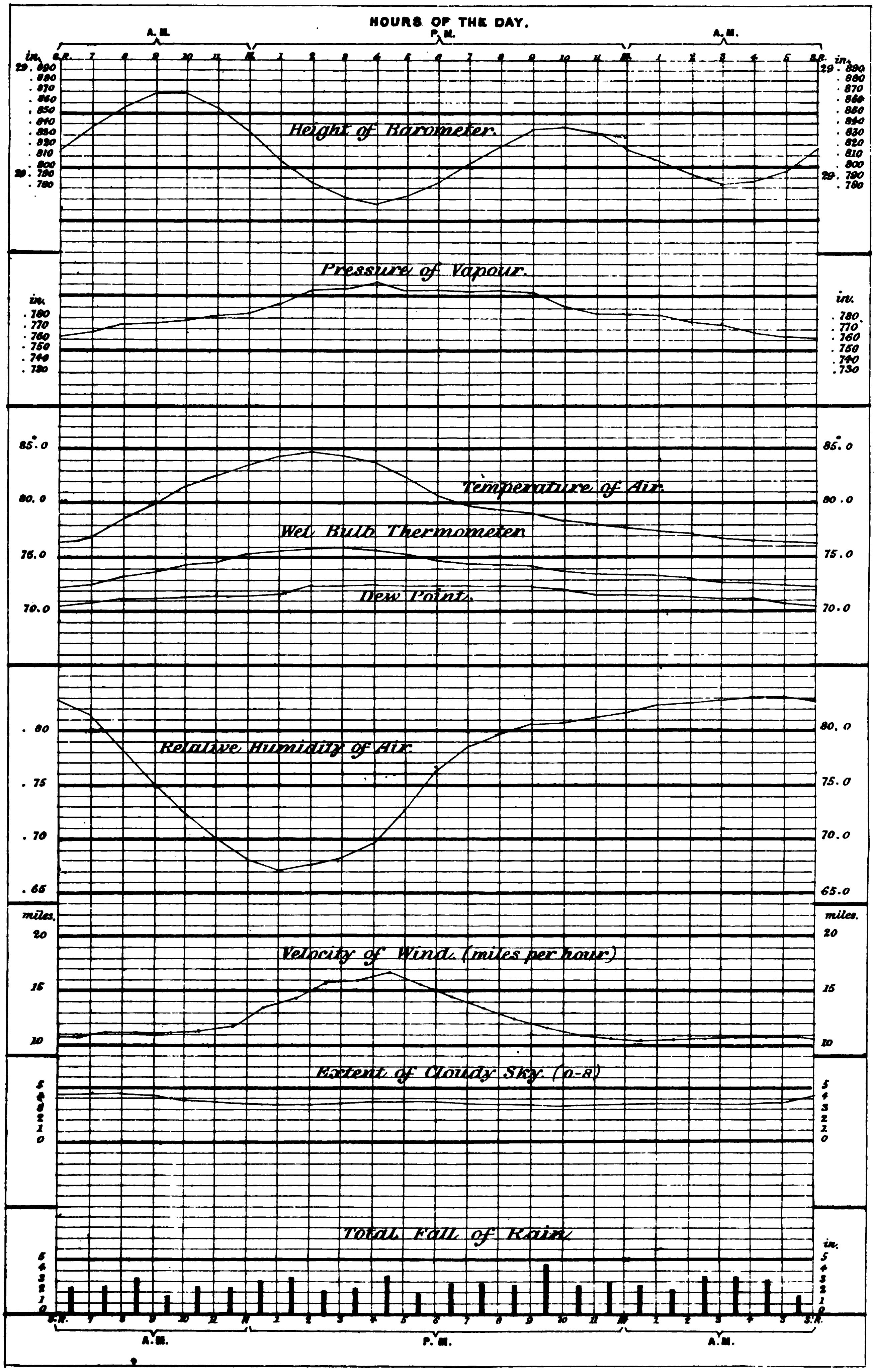
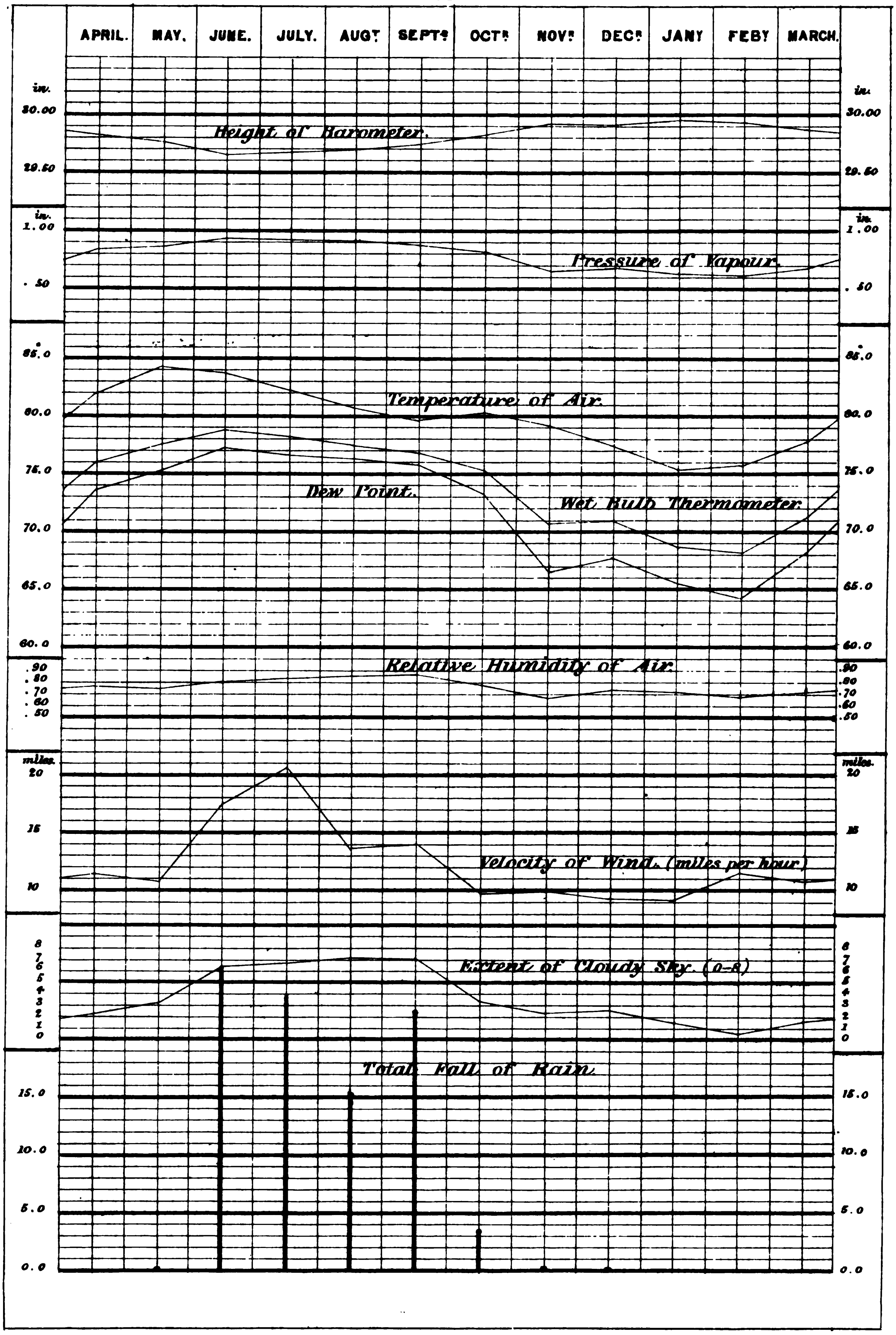


PLATE XV.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS.

1869.



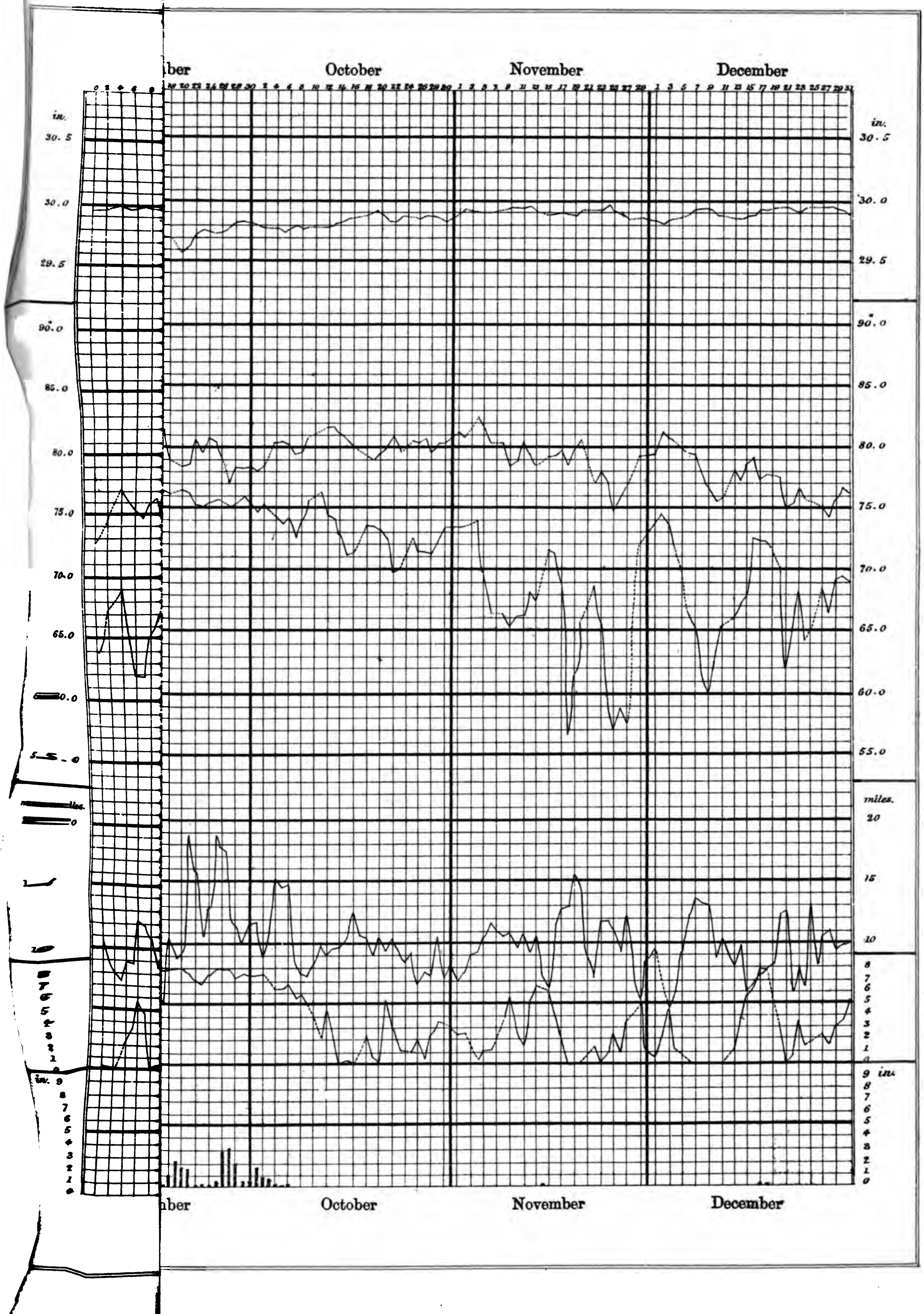

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PLATE XVII.

CURVES SHOWING THE MEAN DIURNAL VARIATION OF METEOROLOGICAL ELEMENTS.

1870.

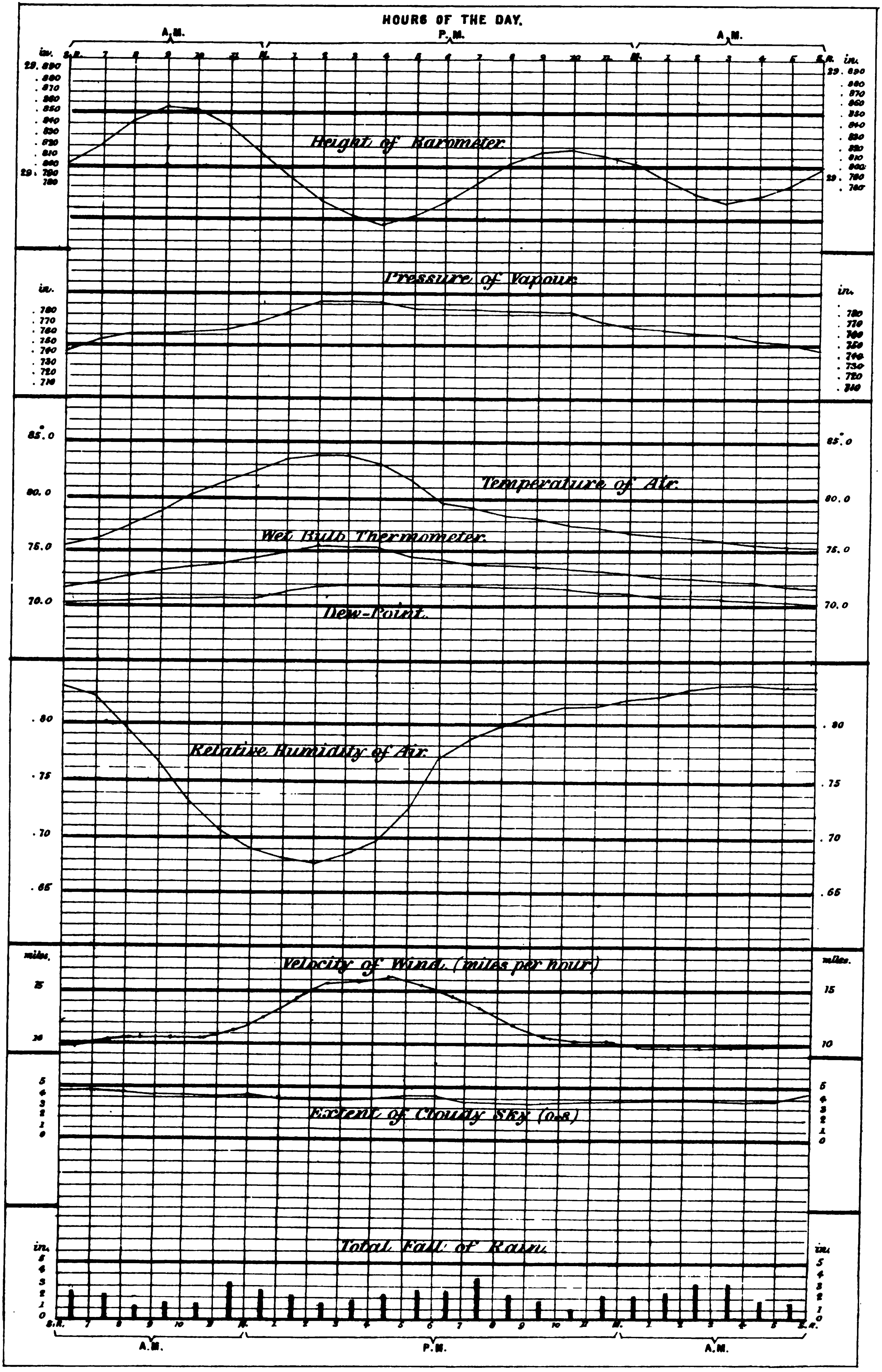
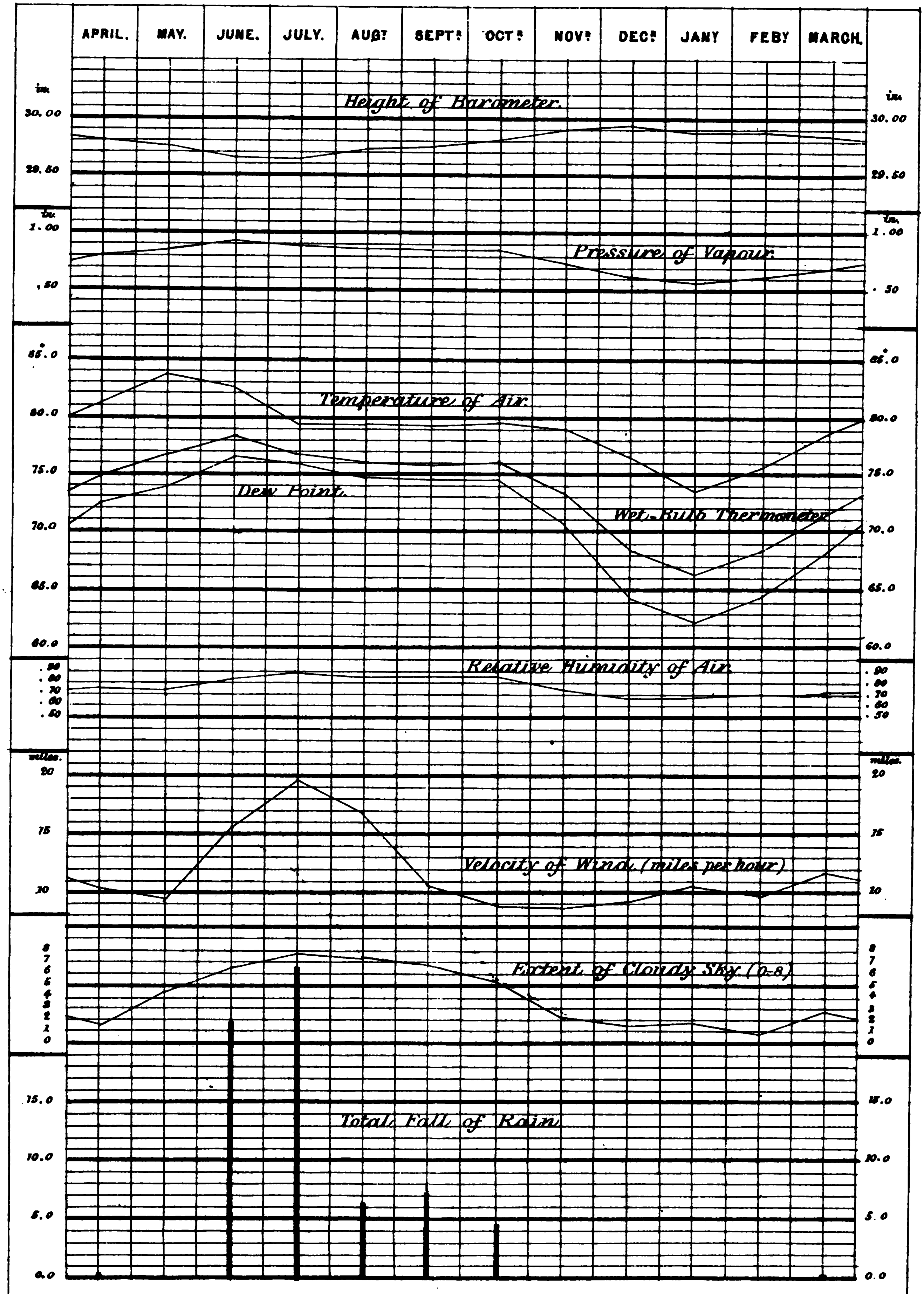
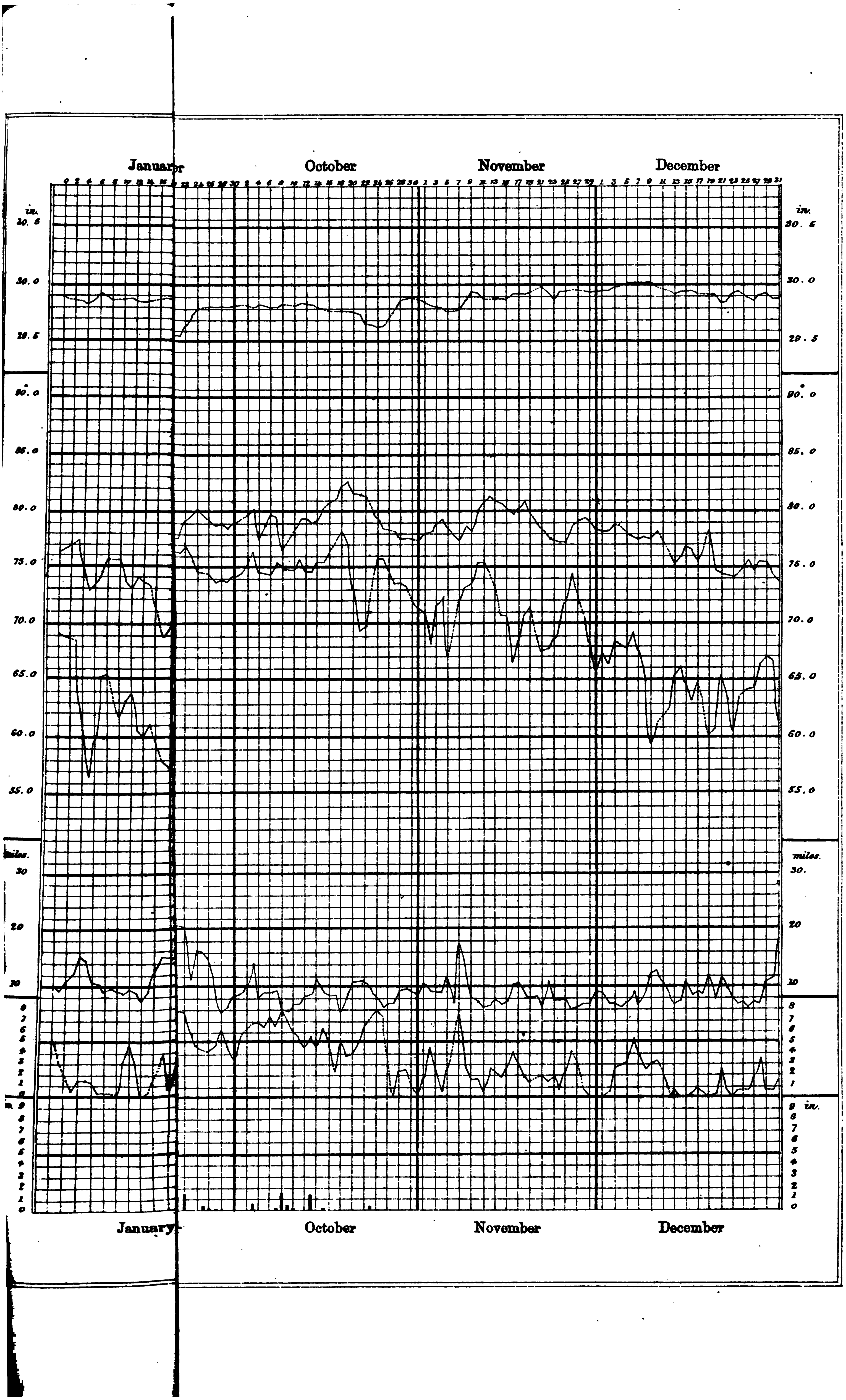


PLATE XVIII.

CURVES SHOWING THE MEAN ANNUAL VARIATION OF METEOROLOGICAL ELEMENTS.
1870.

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TABLES OF RESULTS

OF

ABSOLUTE MAGNETICAL OBSERVATIONS.

1865 to 1870.

Absolute Magnetical Observations.—Table I.

DETERMINATIONS OF ABSOLUTE HORIZONTAL FORCE, 1865 TO 1868.

Observations of Vibration and Deflection for the determination of Absolute Horizontal Force.

1865.

1865.	MAGNET A. 51.		Deflections of Magnet I. 11 by A. 51.		Magnet I. 11.	Corresponding Mean Reading of L. H. F. Magnetometer.		CALCULATED RESULTS IN ENGLISH UNITS.			
Date.	Time of one Vibration.	Effect of 90° Torsion.	R = 1·1 ft.	R = 1·2 ft.	Effect of 90° Torsion.	Scale Reading.	Thermometer.	Values of L. M.	$\frac{X_{1\cdot1}}{X_{1\cdot2}} - 1.$	Values of X.	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12
	s.	Sc. div.	Sc. div.	Sc. div.	′		°				
JAN. 6	3·7875	[5·95]	23·390	18·030	[7·87]	22·75	80·4	·09614	− ·00023	8·0351	8·0340
„ 13	3·7875	6·06	23·365	18·040	[7·77]	22·96	81·8	·09612	+ ·00058	8·0357	
„ 20	3·7933	[6·06]	23·312	17·970	[7·67]	22·69	85·2	·09583	− ·00025	8·0358	
„ 27	3·7950	[6·06]	23·335	17·978	[7·57]	23·41	81·0	·09581	− ·00051	8·0296	
FEB. 3	3·7983	[6·06]	23·290	17·945	[7·47]	22·84	82·8	·09564	− ·00046	8·0302	8·0338
„ 10	3·7900	[6·06]	23·315	17·955	[7·37]	23·80	79·4	·09589	− ·00074	8·0445	
„ 17	3·7975	[6·06]	23·372	18·000	[7·27]	22·65	80·9	·09582	− ·00069	8·0190	
„ 25	3·7934	[6·06]	23·290	17·940	[7·17]	23·62	80·3	·09576	− ·00060	8·0415	
MARCH 3	3·7933	[6·06]	23·280	17·965	[7·07]	23·49	83·4	·09578	+ ·00030	8·0397	8·0404
„ 17	3·7966	[6·06]	23·302	17·962	[6·97]	23·07	82·0	·09572	− ·00025	8·0313	
„ 24	3·7983	1·33	23·282	17·940	6·82	22·95	85·3	·09576	− ·00044	8·0438	
„ 31	3·7967	[1·29]	23·275	17·950	[6·79]	23·61	83·1	·09581	·00000	8·0469	
APRIL 7	3·7956	[1·25]	23·287	17·945	[6·76]	22·95	86·7	·09584	− ·00039	8·0489	8·0442
„ 21			23·302	17·940	[6·70]	21·67	89·8	[·09568]		8·0342*a*	
„ 28	3·8017	[1·13]	23·240	17·907	[6·67]	22·49	89·9	·09560	− ·00046	8·0446	
MAY 5	3·7967	[1·09]	23·187	17·910	[6·64]	22·36	91·1	·09567	+ ·00078	8·0596	8·0498
„ 12	3·7983	[1·05]	23·237	17·930	[6·61]	22·38	89·6	·09571	+ ·00025	8·0500	
„ 19	3·8000	[1·02]	23·260	17·937	[6·57]	21·47	90·1	·09570	− ·00005	8·0438	
„ 26	3·7983	1·00	23·250	17·957	6·51	22·15	91·1	·09576	+ ·00071	8·0458	
JUNE 2	3·7967	[0·97]	23·250	17·930	[6·51]	21·93	91·2	·09576	− ·00002	8·0522	8·0426
„ 9	3·7983	[0·94]	23·293	17·965	[6·51]	22·13	85·7	·09581	+ ·00002	8·0413	
„ 16	3·8000	[0·91]	23·288	17·963	[6·51]	21·85	88·6	·09577	+ ·00009	8·0386	
„ 23	3·8000	[0·88]	23·263	17·912	[6·51]	22·22	87·6	·09567	− ·00081	8·0465	
„ 30			23·262	18·000	[6·51]	22·97	85·4	[·09565]		8·0260*a*	
JULY 21	3·8020	[0·76]	23·272	17·887	[6·51]	22·19	86·8	·09560	− ·00168	8·0447	8·0364
„ 28	3·8083	0·70	23·287	17·937	1·85	22·81	84·1	·09549	− ·00062	8·0281	
AUG. 4	3·8100	[0·68]	23·587	18·150	[1·85]	19·46	83·9	·09604	− ·00108	7·9754	7·9989
„ 11	3·8200	[0·66]	23·287	17·950	[1·85]	21·19	86·5	·09522	− ·00025	8·0021	
„ „	3·8117	[0·64]	23·275	17·963	[1·85]	22·25	84·5	·09543	+ ·00037	8·0191	
SEPT. 8	3·8067	[0·58]	23·425	17·950	[1·85]	21·81	83·5	·09569	− ·00321	8·0185	8·0294
„ 15	3·8000	[0·56]	23·312	17·938	[1·85]	22·30	84·4	·09573	− ·00115	8·0438	
„ 22	3·8033	[0·54]	23·365	18·000	[1·85]	22·74	84·0	·09578	− ·00055	8·0253	
[„ 29]	3·8017	0·52	23·350	17·975	5·62	22·27	85·8	·09581	− ·00092	8·0301	
OCT. 6	3·8040	[0·60]	23·255	17·970	[5·62]	21·70	84·1	·09565	+ ·00097	8·0336	8·0290
„ 13	3·8050	[0·68]	23·300	17·998	[5·62]	22·48	85·1	·09570	+ ·00078	8·0245	
NOV. 3	3·8500	[0·92]	22·675	17·485	[5·62]	22·11	83·2	·09326	− ·00007	8·0417	8·0450
„ 10	3·8487	[1·00]	22·688	17·472	[5·62]	22·19	82·4	·09329	− ·00076	8·0446	
„ 17	3·8490	[1·08]	22·620	17·425	[5·62]	22·80	85·9	·09314	− ·00058	8·0553	
„ 24	3·8477	[1·16]	22·710	17·525	[5·62]	23·35	82·7	·09339	+ ·00028	8·0384	
DEC. 8	3·8303	[1·32]	22·650	17·413	[5·62]	23·19	83·9	·09360	− ·00159	8·0928	……
„ 15	3·8300	[1·40]	22·650	17·438	[5·62]	23·92	81·2	·09364	− ·00085	8·0901	
„ 22	3·8175	[1·48]	22·625	17·575	[5·62]	23·70	81·2	·09410	+ ·00360	8·1030	
„ 29	3·8200	[1·56]	22·712	17·525	[5·62]	24·26	79·2	·09406	+ ·00023	8·0954	
Mean for the Months January to November 1865…………											8·0349

a. These values are included in the monthly means, but with only half the weight of complete independent determinations.

Absolute Magnetical Observations.—Table II.

Observations of Vibration and Deflection, for the determination of Absolute Horizontal Force.

1866.

1866.	Magnet A. 51.		Deflections of Magnet I. 11 by A. 51.		Magnet I. 11.	Corresponding Mean Reading of L. H. F. Magnetometer.		$\frac{dX}{2X}$	Calculated Results in English Units.			
Date.	Time of one Vibration.	Effect of 90° Torsion.	R = 1·1 ft.	R = 1·2 ft.	Effect of 90° Torsion.	Scale Reading.	Thermometer.		Values of L. M.	$\frac{X_{1\cdot 1}}{X_{1\cdot 2}} - 1.$	Values of X.	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13
	s.	Sc. div.	Sc. div.	Sc. div.	Sc. div.		°					
Jan. 6	3·8413	1·60	22·790	17·512	[1·42]	25·26	71·9		·09357	−·00150	8·0443	8·0418
„ „	3·8433	1·52	22·745	17·500	1·42							
„ 13	3·8492	1·36	22·695	17·477	[1·27]	23·90	79·2		·09332	−·00046	8·0375	
„ „	3·8495	1·37	22·717	17·515	1·27							
„ 20	3·8457	1·68	22·697	17·505	[1·31]	24·27	77·9		·09337	+·00007	8·0427	
„ „	3·8477	1·40	22·685	17·500	1·31							
„ 27	3·8460	1·35	22·677	17·490	[1·27]	23·95	78·9		·09332	+·00007	8·0429	
„ „	3·8500	1·30	22·680	17·497	1·27							
Feb. 3	3·8462	1·47	22·687	17·495	[1·50]	24·35	79·2		·09336	−·00034	8·0441	8·0393
„ „	3·8470	1·45	22·695	17·482	1·50							
„ 10	3·8470	1·57	22·735	17·522	[1·54]	24·40	75·7		·09344	−·00041	8·0371	
„ „	3·8463	1·49	22·725	17·510	1·54							
„ 17	3·8450	1·45	22·695	17·500	[1·31]	23·14	78·8		·09340	+·00032	8·0471	
„ „	3·8455	1·45	22·665	17·507	1·31							
„ 24	3·8538	1·45	22·707	17·485	[1·35]	22·66	83·4		·09323	−·00046	8·0290	
„ „	3·8525	1·39	22·705	17·507	1·35							
Mar. 10	3·8507	1·51	22·700	17·507	[1·20]	23·23	82·2		·09325	−·00023	8·0303	8·0426
„ „	3·8543	1·27	22·710	17·500	1·20							
„ 17	3·8458	1·40	22·640	17·460	[1·31]	24·86	81·2		·09330	−·00005	8·0560	
„ „	3·8445	1·37	22·640	17·460	1·31							
„ 24	3·8492	1·34	22·675	17·475	[1.14]	23·20	82·3		·09324	−·00039	8·0416	
„ „	3·8506	1·28	22·680	17·477	1·14							
April 7	3·8544	1·34	22·665	17·475	[1·08]	22·79	84·1		·09313	+·00016	8·0319	8·0454
„ „	3·8546	1·27	22·670	17·500	1·08							
„ 14	3·8471	1·22	22·632	17·482	[0·92]	23·72	84·3		·09326	+·00104	8·0479	
„ „	3·8491	1·20	22·640	17·507	0·92							
„ 21	3 8420	9·07	22·607	17·455	[1·22]	23·32	84·7	·00000	·09309	−·00016	8·0495	
„ „	3·8418	8·64	22·615	17·412	1·22							
„ 28	3·8475	4·92	22·590	17·412	0·97	23·16	85·7	·00000	·09302	−·00018	8·0523	
„ „	3·8479	4·79	22·592	17·422	[0·97]							
May 5	3·8463	5·50	22·592	17·435	[1·06]	22·40	87·5	+·00001	·09303	−·00041	8·0479	8·0521
„ „	3·8501	4·90	22·587	17·436	1·06							
„ 12	3·8443	6·41	22·570	17·425	[1·14]	23·71	86·1	+·00006	·09305	+·00051	8·0532	
„ „	3·8463	6·16	22·580	17·432	1·14							
„ 19	3·8448	6·06	22·587	17·422	[0·97]	22·91	86·9	+·00003	·09306	−·00044	8·0529	
„ „	3·8465	5·51	22·625	17·417	0·97							
„ 26	3·8444	5·92	22·590	17·432	1·03	22·89	87·8	−·00021	·09307	+·00028	8·0545	
June 2	3·8461	5·97	22·590	17·422	[1·11]	22·91	88·9	−·00004	·09304	−·00023	8·0525	8·0543
„ „	3·8458	5·72	22·602	17·415	1·11							
„ 9	3·8456	5·87	22·555	17·415	[1·13]	23·18	90·1	−·00004	·09296	+·00032	8·0562	
„ „	3·8479	5·71	22·552	17·395	1·13							
July 14	3·8425	2·30	22·590	17·422	0·65				·09321	·00000	8·0705	8·0705

[*Continued.*

1866.	Magnet A. 51.		Deflections of Magnet I. 11 by A. 51.		Magnet I. 11.	Corresponding Mean Reading of L. H. F. Magnetometer.		$\frac{d\,X}{2\,X}$	Calculated Results in English Units.			
Date.	Time of one Vibration.	Effect of 90° Torsion.	R = 1·1 ft.	R = 1·2 ft.	Effect of 90° Torsion.	Scale Reading.	Thermometer.		Values of L. M.	$\frac{X_{1\cdot1}}{X_{1\cdot2}} - 1$	Values of X.	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13
	s.	Sc. div.	Sc. div.	Sc. div.	Sc. div.		°					
Aug. 4	3·8572	1·60	22·615	17·400	0·70	22·53	82·7		·09287	−·00120	8·0417	8·0505
,, 6	3·8505	1·57	22·602	17·442	0·67				·09308	+·00032	8·0521	
,, 15	3·8511	2·03	22·562	17·412	[0·61]	22·48	84·0		·09297	+·00032	8·0571	
,, 18	3·8507	1·96	22·600	17·400	0·56	22·90	83·2		·09300	−·00085	8·0560	
,, 28	3·8535	2·51	22·605	17·442	[0·82]	21·87	84·2		·09301	+·00016	8·0458	
,, ,,	3·8517	2·17	22·600	17·432	0·82							
Sept. 8	3·8496	3·47	22·572	17·362	[0·81]	22·50	85·1		·09291	−·00173	8·0603	8·0496
,, ,,	3·8506	2·97	22·588	17·347	0·81							
,, 15	3·8508	3·81	22·620	17·425	[0·89]	21·84	85·8		·09302	−·00048	8·0397	
,, ,,	3·8537	3·39	22·650	17·455	0·89							
,, 22	3·8494	4·32	22·635	17·427	[1·17]	22·03	85·9		·09304	−·00062	8·0423	
,, ,,	3·8515	4·02	22·625	17·435	1·17							
,, 29	3·8486	4·67	22·557	17·380	[1·39]	22·82	84·8		·09295	−·00051	8·0562	
,, ,,	3·8487	4·45	22·565	17·385	1·39							
Oct. 6	3·8501	3·84	22·570	17·407	[1·16]	21·65	86·2		·09295	+·00025	8·0460	8·0513
,, ,,	3·8539	3·69	22·585	17·435	1·16							
,, 13	3·8522	3·81	22·580	17·272	[1·25]	21·81	87·9		·09281	−·00228	8·0553	
,, ,,	3·8532	3·43	22·570	17·390	1·25							
,, 20	3·8492	5·26	22·575	17·407	[1·51]	21·93	88·4		·09295	−·00023	8·0480	
,, ,,	3·8508	4·82	22·575	17·397	1·51							
,, 27	3·8454	6·45	22·555	17·388	[1·59]	22·94	85·6		·09297	−·00005	8·0560	
,, ,,	3·8471	6·09	22·550	17·395	1·59							
Nov. 3	3·8449	7·72	22·570	17·412	[1·73]	22·59	85·2		·09294	−·00009	8·0480	8·0486
,, ,,	3·8492	7·37	22·565	17·390	1·73							
,, 10	3·8443	8·06	22·568	17·395	[1·69]	22·81	85·3		·09298	+·00025	8·0490	
,, ,,	3·8469	7·79	22·565	17·430	1·69							
,, 17	3·8478	7·78	22·560	17·410	1·78	22·32	88·9		·09293	+·00032	8·0451	
,, 24	3·8437	8·57	22·575	17·390	[1·73]	23·55	84·1		·09300	−·00044	8·0523	
,, ,,	3·8440	8·25	22·575	17·400	1·73							
Dec. 1	3·8442	[8·64]	22·595	17·410	[1·89]	23·21	84·2		·09300	−·00071	8·0467	8·0534
,, ,,	3·8454	8·64	22·595	17·392	1·89							
,, 8	3·8434	8·84	22·565	17·402	[1·79]	23·20	86·6		·09296	+·00032	8·0510	
,, ,,	3·8457	8·74	22·537	17·405	1·79							
[,, 15]	3·8403	9·31	22·580	17·382	[1·75]	24·74	79·7		·09306	−·00067	8·0582	
[,, ,,]	3·8397	9·28	22·578	17·398	1·75							
,, 22	3·8426	8·99	22·535	17·402	[1·68]	23·84	82·7		·09295	+·00014	8·0569	
,, ,,	3·8437	8·71	22·545	17·377	1·68							
,, 29	3·8375	9·39	22·588	17·412	[1·90]	24·18	81·6		·09309	−·00067	8·0540	
,, ,,	3·8434	9·22	22·602	17·392	1·90							
Mean for the year 1866............												8·0499

Absolute Magnetical Observations.—Table III.

Observations of Vibration and Deflection, for the determination of Absolute Horizontal Force.

1867.

1867.	MAGNET A. 51.		Deflections of Magnet I. 11 by A. 51.		Magnet I. 11.	Corresponding Mean Reading of L. H. F. Magnetometer.		$\frac{dX}{2X}$	CALCULATED RESULTS IN ENGLISH UNITS.			
Date.	Time of one Vibration.	Effect of 90° Torsion.	R = 1·1 ft.	R = 1·2 ft.	Effect of 90° Torsion.	Scale Reading.	Thermometer.		Values of L. M.	$\frac{X_{1\cdot1}}{X_{1\cdot2}} - 1$	Values of X.	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13
	s.	Sc. div.	Sc. div.	Sc. div.	Sc. div.		°					
JAN. 5	3·8410	9·34	22·540	17·392	[1·75]	24·35	80·2		·09295	+·00129	8·0634	8·0579
„ „	3·8412	9·13	22·550	17·395	1·75							
„ 12	3·8430	8·96	22·570	17·405	[1·79]	23·73	82·7		·09298	+·00018	8·0490	
„ „	3·8457	8·75	22·565	17·415	1·79							
„ 19	3·8427	8·97	22·587	17·410	[1·69]	23·78	81·8		·09309	−·00039	8·0556	
„ „	3·8386	8·58	22·590	17·405	1·69							
„ 26	3·8392	8·46	22·538	17·395	[1·89]	25·12	78·5		·09304	+·00016	8·0636	
„ „	3·8404	9·14	22·535	17·378	1·89							
[FEB. 2]	3·8421	9·34	22·555	17·400	[1·79]	24·84	79·8		·09298	+·00005	8·0542	8·0543
[„ „]	3·8432	9·08	22·555	17·395	1·79							
„ 9	3·8433	9·56	22·472	17·452	[1·83]	23·80	79·4		·09297	+·00353	8·0456	
„ „	3·8465	9·17	22·517	17·492	1·83							
„ 16	3·8435	9·18	22·538	17·432	[1·85]	23·82	81·8		·09286	+·00357	8·0597	
„ „	3·8446	9·00	22·320	17·413	1·85							
„ 23	3·8387	9·59	22·532	17·457	[1·84]	24·97	77·4		·09306	+·00129	8·0579	
„ „	3·8410	9·39	22·537	17·392	1·84							
MAR. 2	3·8401	8·72	22·525	17·408	[1·75]	24·99	80·0		·09305	+·00034	8·0616	8·0623
„ „	3·8399	8·91	22·562	17·388	1·75							
„ 9	3·8407	8·93	22·560	17·325	[1·69]	23·66	81·0		·09292	−·00131	8·0605	
„ „	3·8453	8·79	22·547	17·372	1·69							
„ 16	3·8425	8·44	22·552	17·385	[1·61]	24·20	81·4		·09297	−·00067	8·0577	
„ „	3·8439	8·27	22·570	17·370	1·61							
„ 25	3·8413	7·83	22·527	17·390	[1·56]	24·41	81·5		·09294	−·00023	8·0657	
„ „	3·8445	7·16	22·520	17·337	1·56							
„ 30	3·8425	7·38	22·525	17·377	[1·60]	24·26	84·4		·09291	+·00044	8·0662	
„ „	3·8447	7·32	22·472	17·355	1·60							
APRIL 6	3·8467	6·77	22·497	17·382	[1·60]	23·32	84·4	−·00003	·09287	+·00092	8·0595	8·0622
„ 13	3·8457	6·90	22·512	17·425	[1·60]	23·65	84·5		·09287	+·00067	8·0558	
„ „	3·8496	6·55	22·515	17·347	1·60							
„ 20	3·8442	6·88	22·467	17·317	[1·50]	24·21	84·5		·09281	−·00023	8·0714	
„ „	3·8461	6·72	22·487	17·337	1·50							
„ 27	3·8469	6·37	22·487	17·382	[1·39]	23·46	87·0		·09284	+·00083	8·0623	
„ „	3·8479	6·08	22·487	17·362	1·39							
MAY 4	3·8512	5·73	22·510	17·350	[1·31]	22·19	88·8		·09275	−·00062	8·0553	8·0609
„ „	3·8522	5·37	22·530	17·345	1·31							
„ 13	3·8492	6·00	22·497	17·337	[1·46]	22·94	90·4		·09277	−·00007	8·0629	
„ „	3·8493	5·37	22·482	17·347	1·46							
„ 18	3·8450	7·18	22·480	17·350	[1·67]	23·93	88·0		·09261	+·00039	8·0644	
„ „	3·8466	6·66	22·495	17·365	1·67							
„ 25	3·8478	7·26	22·487	17·360	[1·53]	23·20	89·5		·09280	+·00060	8·0612	
„ „	3·8466	7·28	22·480	17·362	1·53							
JUNE 1	3·8495	6·77	22·520	17·365	[1·56]	22·09	90·6		·09276	−·00039	8·0504	8·0575
„ „	3·8527	6·99	22·495	17·380	1·56							
„ 8	3·8488	7·15	22·415	17·350	[1·53]	22·96	91·3		·09270	+·00147	8·0658	
„ „	3·8479	6·94	22·440	17·347	1·53							
„ 29	3·8502	5·16	22·477	17·410	[1·28]	22·84	86·7		·09279	+·00141	8·0562	
„ „	3·8530	4·39	22·487	17·367	1·28							

[*Continued.*

1866.	Magnet A. 51.		Deflections of Magnet I. 11 by A. 51.		Magnet I. 11.	Corresponding Mean Reading of L. H. F. Magnetometer.			Calculated Results in English Units.			
Date.	Time of one Vibration.	Effect of 90° Torsion.	R = 1·1 ft.	R = 1·2 ft.	Effect of 90° Torsion.	Scale Reading.	Thermometer.	$\frac{dX}{2X}$	Values of L. M.	$\frac{X_{1\cdot1}}{X_{1\cdot2}}-1.$	Values of X.	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13
	s.	Sc. div.	Sc. div.	Sc. div.	Sc. div.		°					
July 20	3·8511	3·63	22·492	17·485	1·06	23·58	84·0	−·00033	·09294	+·00397	8·0490	8·0490
Aug. 8	3·8567	2·11				23·05	84·8		[·09285]		8·0434a	8·0580
,, 12	3·8530	2·69	22·440	17·420	[1·22]	23·38	83·5		·09283	−·00302	8·0592	
,, ,,	3·8524	2·61	22·455	17·415	1·22							
,, 22	3·8538	2·28	22·485	17·425	1·19	22·88	84·7	−·00081	·09278	+·00240	8·0538	
,, 24	3·8522	2·38	22·475	17·435	0·70	23·00	85·0	+·00013	·09280	+·00196	8·0529	
,, ,,	3·8587	2·15	22·510	17·395	0·65							
,, 31	3·8532	2·06	22·460	17·285	0·76	23·04	85·3	+·00006	·09266	−·00083	8·0735	
,, ,,	3·8540	2·16	22·465	17·305	0·73							
Sept. 9	3·8505	2·57	22·445	17·340	0·72	23·05	84·8	−·00013	·09273	+·00076	8·0714	8·0712
,, ,,	3·8528	2·58	22·465	17·350	0·72							
,, 14	3·8541	2·56	22·420	17·277	0·74	23·42	85·1	+·00004	·09260	−·00039	8·0766	
,, ,,	3·8524	2·88	22·440	17·295	0·76							
,, 23	3·8520	2·95	22·480	17·340	0·89	23·20	84·4	·00000	·09271	+·00018	8·0653	
,, ,,	3·8541	3·38	22·470	17·340	0·85							
,, 30	3·8485	3·46	22·470	17·315	0·85	23·38	83·4	·00000	·09274	+·00087	8·0716	
,, ,,	3·8527	3·43	22·427	17·372	0·84							
Oct. 7	3·8540	3·46	22·450	17·315	0·83	23·03	85·2	+·00004	·09263	−·00005	8·0673	8·0661
,, ,,	3·8539	3·44	22·460	17·320	0·83							
,, 12	3·8510	3·66	22·480	17·337	0·90	23·14	86·2	−·00003	·09274	−·00051	8·0673	
,, ,,	3·8517	3·75	22·500	17·320	0·93							
,, 19	3·8480	3·67	22·550	17·335	0·94	23·47	84·9	+·00007	·09287	−·00147	8·0694	
,, ,,	3·8485	3·91	22·525	17·325	0·92							
,, 26	3·8507	4·13	22·535	17·340	0·93	23·24	86·5	+·00022	·09283	−·00094	8·0605	
,, ,,	3·8515	3·90	22·535	17·355	0·93							
Nov. 2	3·8589	4·14	22·317	17·260	1·22	23·87	83·4	+·00009	·09226	+·00106	8·0748	8·0705
,, ,,	3·8587	4·79	22·300	17·225	1·22							
,, 9	3·8611	5·30	22·265	17·120	1·37	23·94	85·9	−·00001	·09194	−·00150	8·0776	
,, ,,	3·8635	7·25	22·295	17·145	1·37							
,, 16	3·8612	8·21	22·287	17·157	1·34	24·37	83·0	−·00013	·09197	−·00106	8·0686	
,, ,,	3·8629	7·87	22·312	17·167	1·35							
,, 23	3·8605	8·02	22·280	17·210	1·29	23·95	84·7	+·00003	·09200	+·00053	8·0664	
,, ,,	3·8637	7·46	22·280	17·195	1·26							
,, 30	3·8625	8·30	22·285	17·190	1·24	24·87	81·1	+·00013	·09200	+·00009	8·0651	
,, ,,	3·8617	8·16	22·300	17·202	1·25							
Dec. 7	3·8617	8·31	22·315	17·197	1·26	24·22	84·2	+·00012	·09201	−·00064	8·0619	8·0607
,, ,,	3·8632	8·16	22·327	17·190	1·27							
,, 14	3·8609	8·22	22·275	17·190	1·15	24·52	82·6	·00000	·09198	+·00009	8·0645	
,, 16	3·8637	8·27	22·312	17·205	1·23							
,, 21	3·8637	8·05	22·357	17·195	1·21	24·22	81·4	−·00009	·09202	−·00060	8·0592	
,, 23	3·8614	8·39	22·315	17·217	1·23							
,, 28	3·8623	8·32	22·317	17·225	1·23	24·94	79·4	−·00007	·09203	+·00039	8·0571	
,, ,,	3·8636	8·33	22·322	17·230	1·24							
										Mean for the year 1867………		8·0609

a. This value is included in the monthly mean, but with only half the weight of a complete independent determination.

TABLES OF RESULTS

OF

ABSOLUTE MAGNETICAL OBSERVATIONS.

1865 to 1870.

Absolute Magnetical Observations.—Table VI.

OBSERVATIONS OF INCLINATION, 1866.

Taken mainly with a Dip Circle of an old pattern, by Henry Barrow, of London.

January.		February.		March.		April.		May.		June.	
Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.
	° ′		° ′		° ′		° ′		° ′		° ′
2	19 12·5	2	19 52·8	6	19 35·9	3	19 22·2	1	[19 18·5]	5	[18 56·3]*a*
5	19 19·0	6	20 32·8	9	19 29·4	6	19 6·2	4	19 0·6	8	19 11·5
9	19 0·3	9	20 33·7	3	19 32·5	7	[18 55·5]*a*	8	[19 16·8]	15	[19 0·5]*b*
12	19 5·9	13	19 31·5	16	19 34·4	10	[19 8·6]	12	19 9·7	19	19 19·4
19	18 54·4	16	19 58·1	20	19 41·9	13	19 10·3	15	[19 8·0]	29	19 4·4
23	19 22·5	20	19 43·4	23	19 45·0	4	[19 10·8]*b*	18	19 7·5		
26	19 10·6	27	19 33·1	27	19 39·4	7	[18 46·9]*a*	22	[18 39·0]*a*		
30	20 6·2			30	19 31·5	12	[18 59·3]*a*	26	19 2·2		
						12	*[19 1·1]*a*	29	[19 10·8]*b*		
						13	[19 14·7]*b*				
						13	†[19 33·9]*b*				
						17	19 10·6				
						20	19 3·4				
						24	19 2·9				
						27	18 57·8				
	° ′		° ′		° ′		° ′		° ′		° ′
	19 16·4		19 57·9		19 36·2		19 6·9		19 5·9		19 6·4

July.		August.		September.		October.		November.		December.	
Day of Month.	Mean Dip	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.	Day of Month.	Mean Dip.
	° ′		° ′		° ′		° ′		° ′		° ′
3	19 27·8	3	18 53·1	4	19 1·9	2	19 2·5	2	19 3·4	4	19 7·2
6	19 7·2	7	18 54·0	7	19 17·2	5	18 59·7	9	19 15·6	7	19 3·7
13	18 57·8	10	19 0·0	11	18 56·9	9	19 3·4	13	19 6·2	11	19 12·5
17	19 4·4	14	18 57·2	14	19 6·5	12	19 1·9	16	19 14·0	14	19 0·6
20	18 53·7	17	18 51·5	18	19 6·5	16	19 4·0	20	19 4·4	18	19 6·9
24	18 51·9	21	18 53·7	21	19 8·4	19	19 3·7	23	19 9·0	21	19 8·7
27	18 51·5	24	18 55·9	25	19 8·4	23	19 10·0	27	19 5·3	28	19 11·2
31	18 50·3	28	18 52·8	28	19 4·4	26	19 7·5				
		31	19 12·8			30	19 13·1				
	° ′		° ′		° ′		° ′		° ′		° ′
	19 0·6		18 56·8		19 6·3		19 5·1		19 8·3		19 7·3

Monthly Means.

The Mean Dip for the year 1866 = 19° 12′·8.

The observations enclosed within brackets, thus [ ] were made with a Dip Circle by Barrow *with microscopes*, and the letters *a* and *b* are used to distinguish observations made with two different 3½ inch needles. Where no letter appears one or other of these needles was used indiscriminately.

* Derived from observations in Azimuths N. 50° W (Dip = 27° 56′·2) and N. 50° E. (Dip = 28° 12′·1).

† Ditto ditto N. 52° W (Dip = 30° 25′·2) and N. 52° E. (Dip = 29° 59′·7).

Absolute Magnetical Observations.—Table VII.

OBSERVATIONS OF INCLINATION—JANUARY TO APRIL 1867.

Taken with a Dip Circle of an old pattern, by Henry Barrow of London.

January.			February.			March.			April.		
Day of Month.	Mean Dip.		Day of Month.	Mean Dip.		Day of Month.	Mean Dip.		Day of Month.	Mean Dip.	
	°	′		°	′		°	′		°	′
4	19	11·2	1	19	14·0	1	19	13·7	2	19	15·6
8	19	8·7	5	18	47·2	5	19	11·2	5	19	12·5
11	19	5·9	8	18	57·5	8	19	12·5	9	19	15·6
15	19	10·3	12	19	5·6	12	19	8·7	12	19	8·7
18	19	6·2	15	19	6·5	15	19	9·7	16	19	15·6
22	19	12·5	19	19	6·5	22	19	11·2	23	19	14·4
25	19	0·9	22	19	13·4	26	19	8·1			
29	19	7·2	26	19	13·7	29	19	12·8			
	19	7·9		19	5·5		19	11·0		19	13·7

Monthly Means.

The Mean Dip for the months January to April 1867 = 19° 9′·5.

Absolute Magnetical Observations.—Table VIII.

Observations of Absolute Declination, 1866 *and* 1867.

1866.

Date.	Bombay Civil Time.	Corresponding Reading of Large Declination Magnetometer.	Absolute Easterly Declination.	Monthly Mean. Corresponding Reading of Large Declination Magnetometer.	Monthly Mean. Absolute Easterly Declination.
1865.	h. m.	Sc. divs.	° ′ ″	Sc. divs.	° ′ ″
Dec. 6	14 43	34·55	0 40 54	34·42	0 39 59
„ 7	12 15	34·29	0 39 36		
1866.					
Jan. 3	12 28	34·65	0 41 7		
„ 4	13 6	34·53	0 39 54		
„ 10	13 2	34·46	0 40 12		
„ 11	12 11	34·18	0 37 20		
„ 17	14 57	34·31	0 39 43		
„ 18	11 56	34·53	0 40 53		
„ 24	12 27	34·40	0 40 34		
„ 25	12 38	34·18	0 38 46		
„ 31	12 9	34·53	0 41 24		
Feb. 1	13 52	34·44	0 39 33	34·57	0 40 33
„ 7	11 54	34·13	0 37 0		
„ 8	12 2	34·37	0 40 32		
„ 21	13 8	35·69	0 47 53		
„ 22	13 5	34·44	0 39 46		
„ 28	12 57	34·35	0 38 54		
Mar. 1	12 34	34·48	0 39 38	34·44	0 40 15
„ 8	12 34	34·50	0 39 10		
„ 21	12 53	34·36	0 39 28		
„ 28	14 18	34·39	0 41 43		
„ 29	12 42	34·46	0 41 16		
April 5	12 44	34·20	0 38 31	34·19	0 39 16
„ 11	12 33	34·13	0 39 16		
„ 12	12 35	34·11	0 38 51		
„ 19	14 1	34·31	0 40 27		
May 2	12 12	33·97	0 37 33	34·33	0 39 0
„ 2	14 16	33·99	0 38 37		
„ 16	12 48	34·29	0 37 53		
„ 17	15 6	34·50	0 39 51		
„ 23	13 34	34·59	0 39 42		
„ 30	11 40	34·53	0 41 41		
„ 31	11 45	34·41	0 37 45		
1866. Date.	h. m.	Sc. divs.	° ′ ″	Sc. divs.	° ′ ″
July 4	12 49	34·50	0 37 11	34·57	0 39 46
„ 19	14 51	34·56	0 41 5		
„ 20	13 40	34·59	0 39 31		
„ 25	13 45	34·58	0 40 6		
„ 26	14 2	34·61	0 41 49		
Aug. 2	13 46	34·58	0 41 22	34·46	0 39 50
„ 22	14 37	34·54	0 40 3		
„ 23	13 3	34·54	0 40 8		
„ 29	14 14	34·48	0 40 11		
„ 30	13 7	34·16	0 38 17		
Sept. 5	12 55	34·63	0 41 14	34·59	0 40 36
„ 12	12 26	34·46	0 40 4		
„ 14	13 12	34·47	0 42 43		
„ 19	14 25	34·92	0 41 33		
„ 20	13 1	34·56	0 40 2		
„ 26	13 5	34·50	0 39 20		
„ 27	12 47	34·59	0 40 29		
Oct. 3	13 0	34·59	0 40 42	34·73	0 41 23
„ 4	13 36	34·55	0 41 18		
„ 11	12 36	34·65	0 40 43		
„ 12	13 39	34·87	0 42 10		
„ 17	12 43	34·64	0 40 46		
„ 18	12 48	34·73	0 41 25		
„ 24	12 54	34·71	0 41 30		
„ 25	12 36	34·80	0 42 5		
„ 31	13 8	35·05	0 43 21		
Nov. 1	14 15	34·86	0 41 41	35·04	0 43 12
„ 7	13 11	34·97	0 42 41		
„ 8	13 42	35·01	0 43 20		
„ 14	12 57	35·23	0 44 26		
„ 21	13 33	35·02	0 43 48		
„ 22	13 42	34·98	0 43 7		
„ 28	13 25	35·14	0 44 13		
„ 29	13 59	35·10	0 43 44		
Dec. 5	13 33	35·12	0 44 7	35·06	0 43 33
„ 6	14 18	35·25	0 45 17		
„ 12	13 25	35·01	0 43 49		
„ 19	13 21	34·98	0 42 34		
„ 20	13 29	34·97	0 40 51		
„ 26	14 25	35·12	0 45 18		
„ 27	13 15	34·95	0 44 3		

The Mean Declination for 1866 (exclusive of June) = 0° 40′ 40″

Absolute Magnetical Observations.—Table IX.

Observations of Absolute Declination, January to June **1867.**

1867. Date.	Bombay Civil Time.	Corresponding Reading of Large Declination Magnetometer.	Absolute Easterly Declination.	Monthly Mean. Corresponding Reading of Large Declination Magnetometer.	Monthly Mean. Absolute Easterly Declination.
	h. m.	Sc. divs.	° ′ ″	Sc. divs.	° ′ ″
Jan. 2	16 5	34·88	0 43 6	34·90	0 42 19
" 3	15 59	35·00	0 43 9		
" 9	15 10	35·01	0 43 0		
" 10	12 53	34·86	0 42 26		
" 16	13 23	34·67	0 40 49		
" 17	13 0	34·45	0 38 42		
" 23	13 3	34·90	0 43 4		
" 24	13 10	35·12	0 44 43		
" 30	13 28	34·94	0 42 17		
" 31	14 20	35·13	0 43 32		
Feb. 6	14 16	34·99	0 42 26	34·93	0 42 22
" 7	13 18	34·95	0 41 53		
" 13	12 52	34·95	0 45 13		
" 14	13 22	34·95	0 42 30		
" 20	15 34	34·90	0 42 4		
" 21	13 58	34·86	0 43 13		
" 27	13 11	34·95	0 41 37		
" 28	13 3	34·90	0 41 24		
March 6	13 18	34·91	0 42 17	34·85	0 41 31
" 7	13 8	34·88	0 41 52		
" 13	13 32	34·80	0 41 26		
" 14	13 44	34·89	0 41 3		
" 20	13 41	34·99	0 43 5		
" 21	13 50	34·88	0 42 50		
" 27	13 42	34·79	0 41 11		
" 28	13 41	34·67	0 39 46		
April 3	13 8	34·66	0 40 16	34·76	0 40 11
" 4	13 24	34·67	0 40 0		
" 10	13 12	34·76	0 39 54		
" 11	13 18	34·89	0 40 14		
" 17	13 11	34·80	0 40 6		
" 18	13 19	34·60	0 39 16		
" 24	12 57	34·83	0 41 0		
" 25	13 46	34·87	0 42 1		
May 2	13 20	34·90	0 42 38	34·85	0 41 45
" 25	14 31	34·92	0 41 23		
" 30	13 28	34·84	0 41 36		
June 5	13 24	34·73	0 42 3		

The Mean Declination for January to May 1867 = 0° 41′ 38″

Absolute Magnetical Observations.—Table X.

DETERMINATIONS OF ABSOLUTE HORIZONTAL FORCE, 1867 TO 1870.

Observations of Vibration and Deflection, taken with the Kew Unifilar Magnetometer (No. 23, by Elliott Brothers), for the determination of Absolute Horizontal Force.

1867.

1867. Date.	Civil Time. Mean.	Magnet N. 23 a. Time of one Vibration. (b)	Magnet N. 23 a. Effect of 90° Torsion.	Magnet N. 23 a. Temperature.	Corresponding Mean Reading of L. H. F. Magnetometer. Scale Reading.	Corresponding Mean Reading of L. H. F. Magnetometer. Thermometer.	Angle of Deflection of Magnet N. 23 c by N. 23 a at Distance 0·8 foot.	Angle of Deflection of Magnet N. 23 c by N. 23 a at Distance 1·0 foot.	Angle of Deflection. Temperature.	Corresponding Mean Reading of L. H. F. Magnetometer. Scale Reading.	Corresponding Mean Reading of L. H. F. Magnetometer. Thermometer.	Observer.	Calculated Results in English Units. Values of m.	Values of X. From Deflections at distance 0·8 foot. ($X_{0·8}$)	Values of X. From Deflections at distance 1·0 foot. ($X_{1·0}$)	Values of X. Difference. $X_{0·8} - X_{1·0}$	Values of X. Mean. $\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s.	Sc. div.	°		°	° ′ ″	° ′ ″	°		°							
June 25	14 17	2·5562	0·35	86·5	23·50	85·1	22 11 16	11 11 34	86·1	22·71	85·5	C. C.	·79424	8·0481	8·0484	− ·0003	8·0482	8·0494
„ 26	14 42	2·5585	0·33	86·2	22·46	86·0	22 9 34	11 10 33	88·2	22·88	86·7	C.C.& C.G.T.	·79386	8·0434	8·0448	− ·0014	8·0441	
July 3	15 21	2·5655	0·19	90·2	22·98	88·2	22 2 55	11 8 14	89·7	22·54	88·9	C. G. T.		8·0429	8·0390	+ ·0039	8·0409	
„ 4	13 4	2·5591	0·22	84·0	23·42	83·0	22 4 18	11 8 49	84·4	23·47	83·6	C. G. T.		8·0584	8·0644	− ·0060	8·0614	
„ 10	14 47	2·5622	0·32	89·8	22·85	87·3	22 3 7	11 6 4	89·6	22·61	87·5	C. G. T.		8·0521	8·0617	− ·0096	8·0569	
„ „	17 0	2·5632	0·37	89·2	22·38	87·0	22 3 26	11 7 50	89·9	22·47	87·6	C. G. T.		8·0472	8·0472	·0000	8·0472	
„ 12	13 4	2·5668	0·30	88·5	23·63	86·5	21 51 5	11 3 27	90·8	23·06	87·8	C. G. T.		8·0705	8·0606	+ ·0099	8·0655	
„ 13	13 36	2·5652	0 34	86·4	23·34	85·2	21 55 12	11 4 20	86·1	23·83	84·9	C. C. & R. S.		8·0659	8·0629	+ ·0030	8·0644	
„ 17	12 55	2·5647	0·31	79·7	24·00	80·0	21 58 0	11 5 44	82·1	23·74	81·0	C. G. T.		8·0573	8·0541	+ ·0032	8·0557	
„ „	15 36	2·5669	0·30	82·1	23·55	81·1	21 57 39	11 5 40	83·5	23·74	81·0	C. G. T.		8·0523	8·0484	+ ·0039	8·0503	
„ 24	11 54	2·5670	0·25	87·6	23·56	85·4	21 30 35	10 53 7	88·4	23·19	85·9	R.S.& C.G.T.		8·1320	8·1244	+ ·0076	8·1282	
„ „	15 29	2·5693	0·21	88·1	22·84	85·8	21 31 2	10 54 30	89·0	23·19	85·9	R.S.& C.G.T.		8·1233	8·1084	+ ·0149	8·1158	
„ 27	12 52	2·5859	0·39	81·6	24·07	80·7	21 32 24	10 53 42	82·4	23·95	80·0	C.G.T.& R.S.		8·0674	8·0616	+ ·0058	8·0645	
„ „	16 19	2·5856	0·26	[82·2]	[23·64]	81·5	21 32 48	10 54 10	82·2	23·95	80·0	R. S.		8·0679	8·0604	+ ·0075	8·0641	
„ 31	12 34	2·5850	0·43	85·6	23·80	84·5	21 36 25	10 54 50	87·5	23·24	85·5	C. C.	·77580	8·0569	80·562	+ ·0007	8·0565	
„ „	15 41	2·5867	0·41	85·0	22·62	85·0	21 36 56	10 55 17	87·3	22·81	85·6	C. G. T.	·77582	8·0498	8·0476	+ ·0022	8·0487	
August 7	13 12	2·5864	0·34	82·2	23·76	80·8	21 37 25	10 54 35	83·6	23·74	81·7	R. S.	·77512	8·0501	8·0539	− ·0038	8·0520	8·0612
„ „	16 14	2·5856	0·26	82·3	23·19	81·9	21 38 10	10 55 15	83·4	23·53	81·8	R. S.	·77580	8·0510	8·0528	− ·0018	8·0519	
„ 13	12 27	2·5834	0·40	81·7	23·62	81·2	21 35 35	10 54 15	82·6	23·04	81·3	C. G. T.	·77516	8·0655	8·0658	− ·0003	8·0656	
„ „	14 59	2·5867	0·39	82·1	22·85	82·3	21 38 33	10 55 31	83·1	22·94	81·6	C. G. T.	·77533	8·0462	8·0476	− ·0014	8·0469	
„ 21	11 20	2·5873	0·41	84·0	23·62	82·8	21 26 35	10 49 35	84·9	23·56	83·6	R. S.	·77206	8·0798	8·0820	− ·0022	8·0809	
„ „	14 46	2·5876	0·39	82·6	23·36	83·0	21 27 47	10 50 20	85·1	23·45	83·7	R. S.	·77234	8·0742	8·0751	− ·0009	8·0746	
„ 28	12 11	2·5927	0·41	84·1	23·56	82·2	21 26 17	10 49 50	84·5	23·42	82·3	C. G. T.	·77035	8·0646	8·0642	+ ·0004	8·0644	
„ „	14 34	2·5960	0·42	85·8	23·22	83·2	21 26 44	10 50 5	85·0	23·20	82·7	C. G. T.	·76973	8·0540	8·0534	+ ·0006	8·0537	

SEPT.	4	12 50	2·5956	0·39	86·1	23·31	84·6	21 26 10	10 49 28	87·1	23·04	85·2	R. S.	·76973	8·0551	8·0565	− ·0014	8·0558	8·0508
„	„	15 11	2·5954	0·40	86·5	22·90	85·1	21 25 45	10 49 15	87·6	23·07	85·1	R. S.	·76996	8·0569	8·0584	− ·0015	8·0576	
„	11	11 59	2·6014	0·42	87·6	23·19	85·4	21 26 10	10 49 38	88·8	23·34	85·9	C. G. T.	·76856	8·0367	8·0371	− ·0004	8·0369	
„	„	13 35	2·5927	0·43	88·0	23·12	86·2	21 27 6	10 49 44	89·0	23·29	86·1	C. G. T.	·77132	8·0512	8·0638	− ·0026	8·0625	
„	18	11 11	2·6001	0·39	83·4	22·75	82·7	21 25 52	10 49 30	83·3	22·93	82·4	R. S.	·76801	8·0433	8·0436	− ·0003	8·0434	
„	„	13 29	2·5982	0·41	84·5	23·24	82·8	21 25 57	10 49 40	84·0	22·93	82·1	R. S.	.76845	8·0492	8·0487	+ ·0005	8·0489	
„	25	12 47	2·5979	0·46	85·3	23·27	82·8	21 24 10	10 48 57	84·9	22·95	83·5	C. G. T.	·76833	8·0553	8·0539	+ ·0014	8·0546	
„	„	14 52	2·6006	0·44	85·8	22·61	83·9	21 24 31	10 48 39	85·3	22·83	83·7	C. G. T.	·76780	8·0460	8·0474	− ·0014	8·0467	
OCT.	2	11 28	2·6009	0·43	85·1	23·40	83·7	21 21 40	10 47 17	84·8	23·31	83·6	R. S.	·76664	8·0534	8·0549	− ·0015	8·0541	8·0569
„	„	13 37	2·6005	0·40	83·2	23·33	80·8	21 21 46	10 47 22	83·8	23·16	82·6	R. S.	·76668	8·0534	8·0547	− ·0013	8·0540	
„	9	12 3	2·6001	0·39	88·2	23·02	85·1	21 21 2	10 47 10	87·2	22·85	86·0	C. G. T.	·76726	8·0582	8·0586	− ·0004	8·0584	
„	„	13 59	2·6025	0·40	87·6	22·57	86·7	21 21 15	10 47 20	87·6	22·77	86·2	C. G. T.	·76671	8·0492	8·0491	+ ·0001	8·0491	
„	16	12 21	2·5960	0·41	84·7	23·71	84·3	21 20 14	10 46 32	85·4	23·37	85·0	R. S.	·76761	8·0721	8·0739	− ·0018	8·0730	
„	„	14 32	2·5991	0·41	84·6	23·06	85·6	21 19 55	10 46 37	85·5	23·17	85·1	R. S.	·76685	8·0633	8·0636	− ·0003	8·0634	
„	23	12 9	2·5994	0·41	86·4	23·34	85·0	21 20 30	10 46 16	87·0	23·00	85·1	C. G. T.	·76682	8·0607	8·0649	− ·0042	8·0628	
„	„	14 1	2·5981	0·42	85·7	22·64	85·6	21 20 30	10 46 24	87·2	22·81	85·1	C. G. T.	·76743	8·0638	8·0671	− ·0033	8·0654	
„	30	12 57	2·6039	0·41	85·7	23·18	84·0	21 20 58	10 47 3	87·5	21·77	85·1	R. S.	·76524	8·0444	8·0450	− ·0006	8·0447	
„	„	15 17	2·6046	0·41	85·6	21·74	85·1	21 20 27	10 46 49	87·5	22·01	85·1	R. S.	·76573	8·0436	8·0444	− ·0008	8·0440	
NOV.	6	12 17	2·6051	0·46	86·2	23·66	85·5	21 18 50	10 45 45	86·5	23·25	87·2	C. G. T.	·76477	8·0483	8·0506	− ·0023	8·0494	8·0523
„	„	14 22	2·6059	0·44	86·6	22·94	87·4	21 18 42	10 45 35	87·1	23·03	87·8	C. G. T.	·76472	8·0459	8·0489	− ·0030	8·0474	
„	13	11 36	2·6039	0·44	81·2	25·00	80·5	21 17 27	10 45 21	83·1	23·68	82·6	R. S.	·76360	8·0549	8·0556	− ·0007	8·0552	
„	15	13 12	2·6106	0·47	83·3	23·86	83·6	21 10 14	10 42 50	84·0	24·47	82·3	R. S.	·76093	8·0569	8·0513	+ ·0056	8·0541	
„	20	11 48	2·6076	0·67	84·1	24·53	81·8	21 14 39	10 43 50	85·3	24·18	83·4	C. G. T.	·76257	8·0519	8·3536	− ·0017	8·0527	
„	„	14 12	2·6089	0·63	86·2	23·59	84·0	21 14 27	10 43 40	85·6	23·84	84·0	C. G. T.	·76253	8·0500	8·0521	− ·0021	8·0510	
„	27	11 47	2·6057	0·72	80·6	24·27	80·4	21 15 25	10 44 20	82·5	24·05	81·5	R. S.	·76290	8·0551	8·0560	− ·0009	8·0555	
„	„	14 19	2·6063	0·62	81·9	23·63	82·0	21 15 40	10 44 35	83·0	23·83	82·0	R. S.	·76313	8·0532	8·0532	·0000	8·0532	
DEC.	4	13 21	2·6093	0·80	85·5	23·89	83·6	21 13 20	10 43 0	82·7	23·69	83·9	C. G. T.	·76150	8·0540	8·0567	− ·0027	8·0553	8·0593 [or 8·0588]
„	„	15 16	2·6092	0·81	85·8	23·63	83·8	21 12 40	10 42 51	83·1	23·64	84·0	C. G. T.	·76155	8·0562	8·0578	− ·0016	8·0570	
„	11	11 43	2·6080	0·63	84·7	24·55	82·8	21 13 0	10 43 5	84·4	23·78	85·3	R. S.	·76182	8·0571	8·0584	− ·0013	8·0577	
„	„	14 21	2·6082	0·66	86·8	23·56	85·8	21 13 7	10 42 55	85·3	23·67	85·8	R. S.	·76225	8·0571	8·0597	− ·0026	8·0584	
„	18	11 23	2·6087	0·74	82·1	24·92	80·9						R. S.	[·76075]				8·0625a	
„	„	16 23	2·6085	0·72	81·4	24·07	82·1						R. S.	[·76075]				8·0625a	
„	20	12 14	2·6094	0·76	82·9	25·06	81·7	21 9 0	10 41 17	82·7	24·76	83·1	R. S.	·76017	8·0646	8·0649	− ·0003	8·0647	
„	„	14 47	2·6099	0·71	85·2	24·11	84·2	21 9 13	10 41 22	84·2	24·39	84·1	R. S.	·76060	8·0631	8·0636	− ·0005	8·0633	
„	24	13 46	2·6096	0·79	82·0	24·39	81·4	21 10 35	10 42 21	80·3	24·17	81·4	R. S.	·76031	8·0605	8·0591	+ ·0014	8·0598	
„	„	15 36	2·6103	0·67	79·4	23·83	81·0	21 10 52	10 42 30	80·2	23·96	81·5	R. S.	·76022	8·0554	8·0539	+ ·0015	8·0546	

The mean value of the Horizontal Force for the months June to December 1867 = { 8·0550 [or 8·0549]

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a. The values for December 18 are included, with half the weight of complete independent determinations, in the monthly and half-yearly values within brackets, and in them only.

b. Corrected for rate of chronometer.

Absolute Magnetical Observations.—Table XI.

Observations of Vibration and Deflection, taken with the Kew Unifilar Magnetometer (No. 23, by Elliott Brothers), for the determination of Absolute Horizontal Force.

1868.

1868. Date.	Civil Time. Mean.	Magnet N. 23 a.			Corresponding Mean Reading of L. H. F. Magnetometer.		Angle of Deflection of Magnet N. 23 c by N. 23 a at			Corresponding Mean Reading of L. H. F. Magnetometer.		Observer.	Calculated Results in English Units.					
		Time of one Vibration. (b)	Effect of 90° Torsion.	Temperature.	Scale Reading.	Thermometer.	Distance		Temperature.	Scale Reading.	Thermometer.		Values of m.	Values of X.				Monthly Mean Values of X.
							0·8 foot.	1·0 foot.						From Deflections at distance		Difference.	Mean.	
														0·8 foot. ($X_{0\cdot8}$)	1·0 foot. ($X_{1\cdot0}$)	$X_{0\cdot8} - X_{1\cdot0}$	$\frac{X_{0\cdot8} + X_{1\cdot0}}{2}$	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s.	Sc. divs.	°		°	° ′ ″	° ′ ″	°		°							
Jan. 2	13 50	2·6119	0·51	84·3	24·34	82·5	21 7 19	10 40 37	84·3	24·26	83·2	C. G. T.	·75934	8·0620	8·0614	+ ·0006	8·0617	8·0608
„ „	15 27	2·6126	0·45	85·0	24·11	83·8	21 7 20	10 40 45	84·6	24·19	83·5	C. G. T.	·75930	8·0605	8·0590	+ ·0015	8·0597	
„ 8	12 12	2·6115	0·49	78·8	25·70	77·5	21 7 25	10 40 42	79·2	25·23	78·2	R. S.	·75841	8·0631	8·0621	+ ·0010	8·0626	
„ „	14 39	2·6123	0·50	77·3	25·12	78·4	21 7 50	10 41 5	79·3	25·13	78·2	R. S.	·75845	8·0581	8·0560	+ ·0021	8·0570	
„ 15	12 30	2·6145	0·54	86·0	24·91	80·4	21 4 42	10 39 13	86·9	24·91	81·1	C. G. T.	·75822	8·0610	8·0612	− ·0002	8·0611	
„ „	14 11	2·6156	0·54	87·1	24·61	82·8	21 4 42	10 39 17	87·3	24·88	81·7	C. G. T.	·75803	8·0582	8·0580	+ ·0002	8·0581	
„ 22	11 49	2·6114	0·62	79·2	25·49	75·9	21 7 6	10 40 21	79·5	25·44	77·1	R. S.	·75861	8·0642	8·0645	− ·0003	8·0643	
„ „	15 18	2·6123	0·57	80·5	24·85	79·0	21 7 10	10 40 17	81·1	25·07	78·6	R. S.	·75861	8·0610	8·0621	− ·0011	8·0615	
„ 29	12 5	2·6125	0·47	82·8	25·26	77·8	21 5 37	10 39 35	83·0	25·19	78·5	C. G. T.	·75840	8·0653	8·0660	− ·0007	8·0656	
„ „	13 48	2·6156	0·49	83·6	24·90	79·0	21 5 35	10 39 32	83·4	25·05	79·0	C. G. T.	·75767	8·0562	8·0571	− ·0009	8·0566	
Feb. 5	11 32	2·6138	0·53	80·2	25·77	76·1	21 5 15	10 39 37	79·7	25·77	76·0	R. S.	·75749	8·0633	8·0625	+ ·0008	8·0629	8·0556
„ „	13 51	2·6147	0·50	82·0	25·45	77·0	21 5 15	10 39 40	79·9	25·66	76·2	R. S.	·75746	8·0618	8·0608	+ ·0010	8·0613	
„ 12	12 37	2·6160	0·53	82·5	25·12	78·3	21 4 45	10 39 25	78·7	25·10	78·6	C. G. T.	·75682	8·0607	8·0597	+ ·0010	8·0602	
„ „	14 8	2·6152	0·54	83·1	24·96	79·0	21 4 46	10 39 26	79·2	25·08	78·8	C. G. T.	·75718	8·0633	8·0621	+ ·0012	8·0627	
„ 19	11 58	2·6166	0·41	84·9	24·92	80·0	21 5 23	10 40 1	84·5	24·83	80·6	R. S.	·75762	8·0540	8·0511	+ ·0029	8·0525	
„ „	14 47	2·6174	0·40	84·3	24·41	82·0	21 5 21	10 39 55	83·9	24·72	81·3	R. S.	·75737	8·0515	8·0493	+ ·0022	8·0504	
„ 26	11 38	2·6173	0·44	84·2	24·94	79·0	21 5 27	10 39 45	85·2	24·80	80·9	C. G. T.	·75742	8·0504	8·0495	+ ·0009	8·0499	
„ „	13 13	2·6192	0·46	86·1	24·31	82·4	21 5 29	10 39 44	85·7	24·63	81·3	C. G. T.	·75708	8·0454	8·0447	+ ·0007	8·0450	
March 4	12 12	2·6168	0·51	79·5	25·69	78·0	21 0 44	10 37 23	79·8	25·46	78·3	R. S.	·75518	8·0670	8·0664	+ ·0006	8·0667	8·0597
„ „	15 51	2·6168	0·42	81·2	24·62	78·9	21 0 45	10 37 28	80·1	25·26	78·6	R. S.	·75580	8·0683	8·0673	+ ·0010	8·0678	
„ 5	15 10	2·6203	0·61	82·1	24·76	77·9	21 1 7	10 37 37	81·4	24·34	78·0	C. G. T.	·75448	8·0556	8·0550	+ ·0006	8·0553	
„ 6	15 10	2·6209	1·09	78·3	24·88	77·3	21 1 25	10 37 49	77·9	25·35	76·7	C. C.	·75416	8·0519	8·0510	+ ·0009	8·0514	
„ 11	12 21	2·6189	0·86	81·3	25·93	79·0	20 58 42	10 36 5	82·7	25·55	79·5	C. G. T.	·75414	8·0650	8·0664	− ·0014	8·0657	
„ „	14 36	2·6207	0·89	83·8	25·08	80·0	20 59 41	10 36 25	83·1	25·38	79·8	C. G. T.	·75439	8·0581	8·0604	− ·0023	8·0592	
„ 18	12 8	2·6206	0·63	82·8	25·02	80·0	21 0 10	10 36 56	82·8	24·85	80·5	R. S.	·75439	8·0569	8·0575	− ·0006	8·0572	
„ „	14 0	2·6207	0·64	83·8	24·42	81·2	20 59 56	10 36 52	83·0	24·51	80·8	R. S.	·75448	8·0579	8·0580	− ·0001	8·0579	
„ 25	12 30	2·6218	0·87	86·3	23·74	83·5	20 58 38	10 36 10	85·6	23·83	83·6	R. S.	·75421	8·0577	8·0584	− ·0007	8·0580	
„ „	14 29	2·6220	0·62	86·0	23·46	83·8	20 58 37	10 36 7	85·9	23·75	83·7	R. S.	·75428	8·0573	8·0582	− ·0009	8·0577	

April	1	11 39	2·6220	0·77	85·9	23·81	81·5	20 59 0	10 36 40	84·6	23·52	81·9	C. G. T.	·75406	8·0569	8·0556	+ ·0013	8·0562	[8·0771] 8·0595
"	"	13 31	2·6208	0·75	84·8	23·44	82·2	20 59 11	10 36 50	84·8	23·55	82·0	C. G. T.	·75459	8·0590	8·0573	+ ·0017	8·0581	
"	8	12 41	2·6200	0·79	88·3	24·76	86·5	20 44 0	10 29 13	88·7	24·36	86·6	R. S.	·75073	8·1074	8·1067	+ ·0007	8·1070	
"	"	14 33	2·6203	0·80	88·6	24·01	86·8	20 44 12	10 29 15	88·8	24·21	86·7	R. S.	·75103	8·1061	8·1058	+ ·0003	8·1059	
"	15	11 51	2·6212	0·83	87·1	24·20	85·0	20 43 40	10 28 53	87·7	24·10	85·3	R. S.	·75024	8·1046	8·1051	− ·0005	8·1048	
"	"	13 34	2·6233	0·74	86·9	23·85	85·9	20 44 8	10 29 10	87·8	23·98	85·5	R. S.	·74986	8·0965	8·0967	− ·0002	8·0966	
"	22	12 39	2·6385	0·86	88·9	24·06	86·0	20 42 15	10 28 19	88·7	23·41	86·4	R. S.	·74487	8·0564	8·0560	+ ·0004	8·0562	
"	"	15 25	2·6356	0·85	88·3	22·66	86·7	20 41 20	10 28 7	88·9	23·08	86·7	R. S.	·74605	8·0674	8·0655	+ ·0019	8·0664	
"	29	13 2	2·6367	0·72	88·7	23·59	85·1	20 42 15	10 28 17	89·9	23·43	85·3	R. S.	·74571	8·0613	8·0612	+ ·0001	8·0612	
"	"	14 58	2·6374	0·86	88·9	23·13	85·1	20 42 17	10 28 15	89·7	23·33	85·4	R. S.	·74569	8·0591	8·0592	− ·0001	8·0591	
May	6	12 40	2·6370	0·76	90·4	24·06	88·2	20 38 45	10 26 16	91·3	23·91	88·6	R. S.	·74478	8·0715	8·0733	− ·0018	8·0724	8·0614
"	"	14 46	2·6381	0·79	90·9	23·41	89·0	20 39 5	10 26 15	91·9	23·64	88·7	R. S.	·74477	8·0668	8·0698	− ·0030	8·0683	
"	13	13 33	2·6400	0·87	91·5	22·86	88·0	20 39 31	10 26 56	91·5	22·75	88·4	R. S.	·74435	8·0606	8·0605	+ ·0001	8·0605	
"	"	15 14	2·6401	0·82	90·8	22·70	88·8	20 39 45	10 26 57	91·7	22·72	88·6	R. S.	·74438	8·0586	8·0592	− ·0006	8·0589	
"	20	11 27	2·6423	0·84	90·2	23·82	88·4	20 36 35	10 25 27	90·8	23·75	88·8	R. S.	·74273	8·0622	8·0623	− ·0001	8·0622	
"	"	13 31	2·6429	0·80	90·8	23·28	89·6	20 36 39	10 25 27	91·2	23·64	89·1	R. S.	·74281	8·0604	8·0608	− ·0004	8·0606	
"	27	12 4	2·6446	0·86	91·2	23·60	88·7	20 36 11	10 25 25	91·8	23·25	89·1	R. S.	·74202	8·0561	8·0553	+ ·0008	8·0557	
"	"	14 11	2·6459	0·86	90·9	22·50	90·2	20 36 7	10 25 10	91·9	22·95	89·4	R. S.	·74190	8·0520	8·0527	− ·0007	8·0523	
June	3	12 9	2·6450	0·86	91·7	23·75	89·8	20 33 6	10 23 37	91·5	23·60	90·1	R. S.	·74102	8·0654	8·0664	− ·0010	8·0659	8·0668
"	"	14 8	2·6460	0·79	91·5	23·16	90·9	20 32 57	10 23 32	92·0	23·47	90·4	R. S.	·74095	8·0622	8·0635	− ·0013	8·0628	
"	10	12 30	2·6455	0·59	86·9	23·85	86·8	20 33 3	10 23 28	87·4	23·58	86·8	R. S.	·74008	8·0641	8·0659	− ·0018	8·0650	
"	"	14 41	2·6461	0·59	87·2	23·34	86·9	20 33 22	10 23 43	87·3	23·44	86·6	R. S.	·74022	8·0614	8·0627	− ·0013	8·0620	
"	17	12 23	2·6460	0·69	87·8	23·89	85·8	20 32 41	10 23 32	87·7	23·59	86·0	R. S.	·74000	8·0641	8·0644	− ·0003	8·0642	
"	"	14 16	2·6459	0·56	86·2	23·51	85·9	20 32 43	10 23 37	87·6	23·54	86·0	R. S.	·74012	8·0631	8·0631	·0000	8·0631	
"	24	11 53	2·6455	0·69	88·8	24·21	86·8	20 28 39	10 21 57	89·7	24·38	87·0	C. G. T.	·73959	8·0771	8·0748	+ ·0023	8·0759	
"	"	13 28	2·6453	0·76	87·8	24·21	86·9	20 28 48	10 21 57	89·9	24·29	87·0	C. G. T.	·73954	8·0762	8·0746	+ ·0016	8·0754	
July	1	11 32	2·6462	0·76	86·2	23·83	85·0	20 30 25	10 22 53	87·4	23·71	85·2	R. S.	·73935	8·0695	8·0668	+ ·0027	8·0681	8·0653 [8·0651]
"	"	13 36	2·6474	0·76	87·0	23·55	85·8	20 30 43	10 23 0	87·6	23·63	85·4	R. S.	·73922	8·0650	8·0627	+ ·0023	8·0638	
"	8	13 0	2·6467	0·76	90·2	24·21	86·1	20 28 30	10 21 52	91·1	23·90	86·2	C. G. T.	·73916	8·0739	8·0718	+ ·0021	8·0728	
"	"	14 23	2·6475	0·78	91·3	23·68	86·4	20 29 13	10 21 55	91·1	23·83	86·3	C. G. T.	·73937	8·0700	8·0698	+ ·0002	8·0699	
"	15	11 51	2·6492	0·64	83·2	22·78	81·6						R. S.	[·73812]				8·0592 *a*	
"	16	13 20	2·6480	0·56	81·2	24·16	80·5	20 30 42	10 22 53	82·0	23·93	80·5	R. S.	·73799	8·0639	8·0621	+ ·0018	8·0630	
"	"	15 5	2·6490	0·57	81·4	23·69	80·9	20 30 38	10 23 0	82·2	23·79	80·6	R. S.	·73794	8·0611	8·0584	+ ·0027	8·0597	
"	22	12 10	2·6496	0·64	86·4	24·50	83·8	20 28 22	10 21 33	87·1	24·25	83·6	C. G. T.	·73761	8·0659	8·0655	+ ·0004	8·0657	
"	"	14 24	2·6497	0·61	86·7	23·87	84·0	20 28 6	10 21 22	87·4	24·02	83·8	C. G. T.	·73777	8·0665	8·0662	+ ·0003	8·0663	
"	29	12 48	2·6493	0·61	81·8	24·24	81·6	20 29 47	10 22 8	83·0	23·96	81·1	R. S.	·73734	8·0624	8·0625	− ·0001	8·0624	
"	"	14 40	2·6495	0·66	81·8	23·79	81·1	20 29 48	10 22 6	82·9	23·98	81·0	R. S.	·73756	8·0616	8·0621	− ·0005	8·0618	
August	5	13 0	2·6535	0·61	87·3	23·68	83·7	20 29 43	10 22 14	88·1	23·65	84·1	C. G. T.	·73726	8·0500	8·0491	+ ·0009	8·0495	+1 8·0489
"	"	14 39	2·6535	0·63	87·7	23·52	84·2	20 29 52	10 22 22	88·5	23·67	84·2	C. G. T.	·73745	8·0494	8·0484	+ ·0010	8·0489	
"	12	12 35	2·6531	0·62	82·7	24·17	81·5	20 29 45	10 22 16	84·9	23·98	81·5	C. G. T.	·73665	8·0500	8·0493	+ ·0007	8·0496	
"	"	14 6	2·6543	0·66	82·9	23·92	82·0	20 29 55	10 22 20	85·2	24·00	81·8	C. G. T.	·73652	8·0457	8·0451	+ ·0006	8·0454	
"	19	12 32	2·6547	0·61	84·6	24·81	83·3	20 29 47	10 22 17	86·8	24·67	83·8	C. G. T.	·73660	8·0450	8·0442	+ ·0008	8·0446	
"	"	13 57	2·6546	0·59	85·4	24·26	83·9	20 30 0	10 22 30*	87·1	24·55	84·0	C. G. T.	−4 ·73701	8·0450	+8 8·0436	+ ·0014	+4 8·0443	
"	26	12 18	2·6548	0·61	83·8	23·92	83·8	20 25 57	10 20 2	84·9	23·69	83·9	R. S.	·73502	8·0576	8·0594	− ·0018	8·0585	
"	"	16 5	2·6553	0·62	84·1	23·34	83·9	20 27 27	10 21 7	85·7	23·40	84·0	R. S.	·73568	8·0509	8·0504	+ ·0005	8·0506	
Sept.	2	12 23	2·6547	0·66	85·2	23·55	83·3	20 26 0	10 20 37	85·1	23·46	83·8	R. S.	·73544	8·0587	8·0566	+ ·0021	8·0576	
"	"	14 22	2·6549	0·64	85·2	23·30	84·0	20 25 57	10 20 17	85·4	23·48	83·9	R. S.	·73543	8·0582	8·0581	+ ·0001	8·0581	

a. The value for July 15 is included, with half the weight of a complete independent determination, in the monthly and yearly values within brackets, and in them only.

* Should be 10° 22′ 22″ the corrections required are marked in small figures, but have not been applied.

[*Continued.*

1868.		Magnet N. 23 *a*.			Corresponding Mean Reading of L. H. F. Magnetometer.		Angle of Deflection of Magnet N. 23 *c* by N. 23 *a* at			Corresponding Mean Reading of L. H. F. Magnetometer.			Calculated Results in English Units.					
							Distance							Values of X.				
														From Deflections at distance		Difference.	Mean.	
Date.	Civil Time. Mean.	Time of one Vibration. (*b*.)	Effect of 90° Torsion.	Temperature.	Scale Reading.	Thermometer.	0·8 foot.	1·0 foot.	Temperature.	Scale Reading.	Thermometer.	Observer.	Values of m.	0·8 foot. $(X_{0·8})$	1·0 foot. $(X_{1·0})$	$X_{0·8} - X_{1·0}$	$\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s.	Sc. div.	°		°	° ′ ″	° ′ ″	°		°							
Sept. 9	12 31	2·6545	0·66	85·9	23·65	83·0	20 23 50	10 19 12	85·3	23·68	83·0	C. G. T.	·73490	8·0667	8·0670	− ·0003	8·0668	8·0546
,, ,,	14 17	2·6542	0·63	85·7	23·60	82·9	20 24 5	10 19 32	85·3	23·68	83·0	C. G. T.	·73512	8·0667	8·0655	+ ·0012	8·0661	
,, 16	12 34	2·6622	0·71	86·4	22·03	84·2	20 26 33	10 20 26	86·8	21·54	84·6	R. S.	·73343	8·0337	8·0345	− ·0008	8·0341	
,, ,,	14 21	2·6620	0·66	86·3	20·69	84·8	20 26 52	10 20 29	87·1	21·32	84·6	R. S.	·73412	8·0330	8·0345	− ·0015	8·0337	
,, 23	12 41	2·6559	0·66	87·6	23·46	85·0	20 22 15	10 18 32	87·9	23·28	85·0	C. G. T.	·73430	8·0663	8·0661	+ ·0002	8·0662	
,, ,,	15 57	2·6598	0·66	87·4	22·84	85·1	20 22 14	10 18 38	87·9	23·04	85·2	C.G.T. & C.C.	·73346	8·0545	8·0534	+ ·0011	8·0539	
,, 30	12 43	2·6599	0·72	86·9	23·51	83·8	20 21 45	10 18 2	86·8	23·33	83·9	R. S.	·73284	8·0559	8·0571	− ·0012	8·0565	
,, ,,	14 37	2·6605	0·71	86·7	23·13	84·0	20 21 47	10 18 32	87·1	23·33	83·8	R. S.	·73302	8·0537	8·0519	+ ·0018	8·0528	
Oct. 7	13 29	2·6605	0·77	87·9	23·38	84·9	20 21 16	10 18 12	87·7	23·13	84·9	R. S.	·73275	8·0558	8·0545	+ ·0013	8·0551	8·0637
,, ,,	15 44	2·6608	0·74	86·8	22·93	84·7	20 21 31	10 18 14	87·9	22·95	84·9	R. S.	·73282	8·0530	8·0521	+ ·0009	8·0525	
,, 14	13 14	2·6596	0·72	87·6	24·05	86·1	20 18 52	10 16 57	88·5	23·81	86·1	R. S.	·73233	8·0652	8·0644	+ ·0008	8·0648	
,, ,,	15 13	2·6605	0·77	88·0	23·57	87·1	20 19 0	10 17 10	88·5	23·64	86·3	R. S.	·73232	8·0624	8·0607	+ ·0017	8·0615	
,, 21	12 28	2·6611	0·83	90·7	23·96	87·6	20 16 37	10 15 47	91·2	23·81	87·9	C. G. T.	·73179	8·0678	8·0674	+ ·0004	8·0676	
,, ,,	14 23	2·6618	0·91	90·9	23·56	88·7	20 16 27	10 15 40	91·6	24·04	88·5	C. G. T.	·73187	8·0655	8·0653	+ ·0002	8·0654	
,, 28	13 28	2·6612	0·94	88·2	23·37	85·5	20 15 27	10 14 45	89·6	23·12	85·8	R. S.	·73090	8·0700	8·0726	− ·0026	8·0713	
,, ,,	15 7	2·6616	0·81	87·8	22·95	86·1	20 15 10	10 14 30	89·8	23·01	86·0	R. S.	·73081	8·0696	8·0730	− ·0034	8·0713	
Nov. 4	12 31	2·6609	0·77	91·4	24·19	87·8	20 12 32	10 13 37	91·5	24·00	88·9	R. S.	·73073	8·0817	8·0824	− ·0007	8·0820	8·0659
,, ,,	14 31	2·6622	0·72	90·5	23·68	88·9	20 12 35	10 13 39	91·5	23·83	88·9	R. S.	·73045	8·0771	8·0775	− ·0004	8·0773	
,, 11	12 46	2·6667	0·75	87·3	24·42	83·9	20 11 17	10 12 47	87·8	24·18	84·4	C. G. T.	·72804	8·0680	8·0702	− ·0022	8·0691	
,, ,,	14 35	2·6673	0·74	86·1	23·95	84·9	20 11 37	10 13 7	87·8	24·01	84·7	C. G. T.	·72803	8·0641	8·0651	− ·0010	8·0646	
,, 18	12 42	2·6721	0·87	87·1	24·89	83·2	20 6 37	10 10 30	87·7	24·57	84·0	C. G. T.	·72515	8·0663	8·0683	− ·0020	8·0673	
,, ,,	14 45	2·6742	0·82	87·7	24·14	85·0	20 6 47	10 10 47	89·0	24·32	84·8	C. G. T.	·72507	8·0589	8·0595	− ·0006	8·0592	
,, 25	14 21	2·6743	0·85	86·6	23·58	83·7	20 8 45	10 11 30	86·6	23·50	83·8	C. G. T.	·72512	8·0533	8·0556	− ·0023	8·0544	
,, ,,	15 45	2·6742	0·82	86·0	23·47	84·0	20 8 45	10 11 47	86·6	23·48	83·8	C. G. T.	·72522	8·0533	8·0538	− ·0005	8·0535	
Dec. 2	12 49	2·6727	0·82	87·8	24·82	83·2	20 5 32	10 10 7	88·2	24·53	83·7	C. G. T.	·72482	8·0682	8·0692	− ·0010	8·0687	8·0588
,, ,,	14 57	2·6750	0·78	87·9	24·19	85·2	20 5 31	10 10 15	88·7	24·30	84·4	C. G. T.	·72442	8·0611	8·0612	− ·0001	8·0611	
,, 9	12 20	2·6729	0·80	83·5	24·84	81·3	20 5 41	10 10 13	86·4	24·57	82·4	F. C.	·72440	8·0652	8·0661	− ·0009	8·0656	
,, ,,	14 37	2·6752	0·99	87·2	24·26	83·2	20 6 3	10 10 33	87·1	24·36	83·0	F. C.	·72432	8·0591	8·0590	+ ·0001	8·0590	
,, 16	13 34	2·6773	0·75	86·5	24·53	82·5	20 6 9	10 10 49	86·4	24·22	83·0	R. S.	·72360	8·0530	8·0514	+ ·0016	8·0522	
,, ,,	15 43	2·6776	0·74	85·7	23·77	83·4	20 6 48	10 11 2	86·2	23·92	83·4	R. S.	·72398	8·0513	8·0504	+ ·0009	8·0508	
,, 23	13 5	2·6740	0·93	84·2	24·94	80·1	20 6 55	10 10 52	83·1	24·81	80·8	F. C.	·72426	8·0613	8·0618	− ·0005	8·0615	
,, ,,	15 16	2·6744	0·93	82·0	24·27	81·1	20 7 16	10 11 3	83·3	24·62	81·1	F. C.	·72432	8·0569	8·0573	− ·0004	8·0571	
,, 30	12 50	2·6735	0·85	82·2	24·77	78·6	20 7 37	10 11 17	82·2	24·55	79·6	C. G. T.	·72440	8·0597	8·0597	·0000	8·0597	
,, ,,	15 1	2·6748	0·88	81·0	24·09	80·8	20 8 20	10 11 47	82·1	24·17	80·2	C. G. T.	·72423	8·0526	8·0517	+ ·0009	8·0521	

The mean value of the Horizontal Force for the year 1868 = { 8·0601 [8·0615]

b. Corrected for rate of Chronometer.

Absolute Magnetical Observations.—Table XII.

Observations of Vibration and Deflection, taken with the Kew Unifilar Magnetometer (No. 23, by Elliott Brothers) for the determination of Absolute Horizontal Force.

1869.

1869. Date.		Civil Time. Mean.	Magnet N. 23 *a*. Time of one Vibration. (*b*.)	Magnet N. 23 *a*. Effect of 90° Torsion.	Magnet N. 23 *a*. Temperature.	Corresponding Mean Reading of L. H. F. Magnetometer. Scale Reading.	Corresponding Mean Reading of L. H. F. Magnetometer. Thermometer.	Angle of Deflection of Magnet N. 23 *c* by N. 23 *a* at Distance 0·8 foot.	Angle of Deflection of Magnet N. 23 *c* by N. 23 *a* at Distance 1·0 foot.	Angle of Deflection ... Temperature.	Corresponding Mean Reading of L. H. F. Magnetometer. Scale Reading.	Corresponding Mean Reading of L. H. F. Magnetometer. Thermometer.	Observer.	Calculated Results in English Units. Values of m.	Values of X. From Deflections at Distance 0·8 foot. ($X_{0·8}$)	Values of X. From Deflections at Distance 1·0 foot. ($X_{1·0}$)	Values of X. Difference. $X_{0·8} - X_{1·0}$	Values of X. Mean. $\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
		h. m.	s.	Sc. div.	°		°	° ′ ″	° ′ ″	°		°							
Jan.	6	13 23	2·6744	0·95	82·5	24·97	79·5	20 5 51	10 10 20	83·9	24·80	80·0	F. C.	·72374	8·0611	8·0618	− ·0007	8·0614	8·0616
„	„	15 33	2·6753	0·93	82·8	24·55	81·1	20 5 40	10 10 21	84·7	24·81	80·5	F. C.	·72373	8·0587	8·0586	+ ·0001	8·0586	
„	9	13 1	2·6754	1·08	85·0	24·62	80·4	20 4 36	10 9 15	88·1	24·44	81·9	F. C.	·72356	8·0604	8·0640	− ·0036	8·0622	
„	„	15 34	2·6756	0·96	85·2	24·33	83·8	20 4 35	10 9 55	87·8	24·40	83·0	F. C.	·72366	8·0602	8·0595	+ ·0007	8·0598	
„	13	12 58	2·6731	0·79	81·4	25·35	78·6	20 6 22	10 10 25	82·5	24·91	79·2	C. G. T.	·72389	8·0641	8·0659	− ·0018	8·0650	
„	„	14 55	2·6745	0·90	81·7	24·55	80·1	20 6 12	10 10 40	82·5	24·74	79·9	C. G. T.	·72383	8·0606	8·0601	+ ·0005	8·0603	
„	20	12 57	2·6732	0·92	84·9	25·17	80·8	20 4 24	10 9 40	85·0	24·91	81·2	R. S.	·72389	8·0706	8·0709	− ·0003	8·0707	
„	„	15 17	2·6797	0·82	82·3	22·48	82·6	20 5 15	10 11 21	85·0	23·28	82·0	R. S.	·72305	8·0461	8·0383	+ ·0078	8·0422	
„	27	13 23	2·6744	0·73	85·3	24·48	82·0	20 2 35	10 9 22	85·9	24·17	82·3	C. G. T.	·72331	8·0725	8·0690	+ ·0035	8·0707	
„	„	15 49	2·6759	0·79	85·0	23·84	82·2	20 3 2	10 9 25	85·9	24·01	82·2	C. G. T.	·72318	8·0663	8·0638	+ ·0025	8·0650	
Feb.	3	12 46	2·6726	0·66	82·1	24·01	79·3	20 6 39	10 10 52	83·4	23·58	79·9	R. S.	·72435	8·0648	8·0646	+ ·0002	8·0647	8·0688
„	„	15 3	2·6767	0·65	82·8	22·88	80·3	20 6 55	10 11 9	83·8	23·13	80·1	R. S.	·72374	8·0518	8·0504	+ ·0014	8·0511	
„	10	12 21	2·6712	0·70	79·2	25·37	74·9	20 6 5	10 10 31	80·0	25·30	75·9	C. G. T.	·72426	8·0711	8·0715	− ·0004	8·0713	
„	„	14 29	2·6733	0·68	81·2	24·72	77·5	20 5 22	10 10 23	80·4	24·95	76·8	C. G. T.	·72376	8·0685	8·0674	+ ·0011	8·0679	
„	17	12 46	2·6748	0·72	83·4	24·86	80·9	20 3 35	10 9 11	84·0	24·68	81·5	R. S.	·72310	8·0683	8·0692	− ·0009	8·0687	
„	„	15 4	2·6758	0·66	82·8	24·26	82·9	20 3 57	10 9 29	84·0	24·35	82·5	R. S.	·72300	8·0637	8·0638	− ·0001	8·0637	
„	24	12 17	2·6719	0·67	84·9	24·60	81·4	20 0 54	10 8 12	86·1	24·55	82·4	C. G. T.	·72360	8·0852	8·0839	+ ·0013	8·0845	
„	„	14 25	2·6739	0·69	86·8	24·21	83·8	20 1 8	10 8 26	86·8	24·40	83·2	C. G. T.	·72336	8·0794	8·0771	+ ·0023	8·0782	
Mar.	3	12 48	2·6735	0·65	86·1	23·84	83·6	20 3 1	10 9 3	87·0	23·50	83·7	R. S.	·72366	8·0738	8·0737	+ ·0001	8·0737	8·0655
„	„	14 49	2·6757	0·73	85·5	22·87	83·2	20 3 12	10 9 6	86·8	23·20	83·4	R. S.	·72336	8·0659	8·0662	− ·0003	8·0660	
„	10	12 14	2·6758	0·76	83·7	24·57	79·9	20 3 17	10 8 57	83·4	24·34	80·2	C. G. T.	·72262	8·0670	8·0685	− ·0015	8·0677	
„	„	14 19	2·6778	0·80	83·9	23·33	80·9	20 3 12	10 9 10	83·8	23·69	80·7	C. G. T.	·72245	8·0609	8·0607	+ ·0002	8·0608	
„	17	12 29	2·6775	0·58	81·7	25·61	80·9	20 0 50	10 8 7	81·9	25·33	81·3	R. S.	·72131	8·0696	8·0687	+ ·0009	8·0691	
„	„	14 36	2·6787	0·70	81·3	24·59	82·0	20 1 11	10 8 16	81·4	24·90	81·8	R. S.	·72125	8·0650	8·0642	+ ·0008	8·0646	
„	24	12 25	2·6792	0·72	86·6	25·04	83·0	19 58 25	10 6 45	87·1	24·74	83·8	C. G. T.	·72088	8·0715	8·0716	− ·0001	8·0715	
„	„	14 36	2·6817	0·59	87·0	24·31	84·0	19 58 16	10 6 45	87·2	24·46	83·9	C. G. T.	·72042	8·0648	8·0646	+ ·0002	8·0647	
„	31	14 12	2·6817	0·77	85·5	23·97	84·1	19 59 32	10 7 19	86·7	24·05	84·2	F. C.	·72057	8·0597	8·0597	·0000	8·0597	
„	„	16 1	2·6824	0·72	85·7	23·82	84·1	19 59 3[illegible]	10 7 28	86·7	23·93	84·2	F. C.	·72047	8·0580	8·0571	+ ·0009	8·0575	

b. Corrected for rate of Chronometer.

[*Continued*.

1869.		Magnet N. 23 *a*.			Corresponding Mean Reading of L. H. F. Magnetometer.		Angle of Deflection of Magnet N. 23 *c* by N. 23 *a* at			Corresponding Mean Reading of L. H. F. Magnetometer.		Observer.	Calculated Results in English Units.					
Date.	Civil Time. Mean.	Time of one Vibration. (*b*.)	Effect of 90° Torsion.	Temperature.	Scale Reading.	Thermometer.	Distance 0·8 foot.	Distance 1·0 foot.	Temperature.	Scale Reading.	Thermometer.		Values of m.	Values of X. From Deflections at Distance. 0·8 foot. ($X_{0·8}$)	Values of X. From Deflections at Distance. 1·0 foot. ($X_{1·0}$)	Values of X. Difference. $X_{0·8} - X_{1·0}$	Values of X. Mean. $\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s.	Sc. div.	°		°	° ′ ″	° ′ ″	°		°							
APRIL 7	12 49	2·6816	0·60	89·2	23·89	85·8	19 58 1	10 5 42	88·1	23·77	85·9	C. G. T.	·72021	8·0672	8·0731	− ·0059	8·0701	8·0616
" "	14 46	2·6823	0·57	89·3	23·44	85·4	19 58 10	10 6 30	88·4	23·53	85·9	C. G. T.	·72046	8·0644	8·0655	− ·0011	8·0649	
" 14	12 3	2·6827	0·62	88·4	23·95	86·0	19 59 56	10 8 5	88·9	23·83	86·4	R. S.	·72093	8·0563	8·0527	+ ·0036	8·0545	
" "	14 45	2·6831	0·56	88·8	23·49	87·1	20 0 5	10 6 2	89·6	23·48	86·9	R. S.	·72037	8·0541	8·0644	− ·0103	8·0592	
" 21	12 30	2·6811	0·39	87·7	23·97	86·0	19 58 7	10 6 27	89·3	23·67	86·1	C. G. T.	·72052	8·0663	8·0675	− ·0012	8·0669	
" "	14 58	2·6841	0·53	86·0	22·96	86·5	19 59 39	10 7 32	89·3	23·17	86·4	C. G. T.	·72036	8·0505	8·0497	+ ·0008	8·0501	
" 28	11 49	2·6834	0·74	88·4	24·55	85·8	19 56 14	10 5 52	88·8	24·39	85·9	R. S.	·71948	8·0657	8·0648	+ ·0009	8·0652	
" "	14 6	2·6840	0·62	87·5	23·76	86·5	19 56 31	10 6 6	88·6	23·94	86·4	R. S.	·71955	8·0626	8·0610	+ ·0016	8·0618	
MAY 5	12 12	2·6859	0·55	89·7	23·01	86·9	19 58 16	10 6 37	89·9	22·81	87·1	C. G. T.	·71955	8·0522	8·0528	− ·0006	8·0525	8·0547
" "	14 25	2·6872	0·53	90·2	22·42	87·9	19 58 30	10 6 50	90·6	22·68	87·7	C. G. T.	·71960	8·0474	8·0473	+ ·0001	8·0473	
" 12	13 28	2·6869	0·52	87·9	23·17	87·2	19 55 10	10 5 16	88·3	23·17	87·3	R. S.	·71823	8·0593	8·0588	+ ·0005	8·0590	
" "	15 31	2·6875	0·55	88·2	22·84	87·7	19 55 6	10 5 16	88·7	22·99	87·6	R. S.	·71820	8·0574	8·0567	+ ·0007	8·0570	
" 19	12 4	2·6868	0·70	91·6	23·97	87·0	19 59 31	10 8 22	90·4	23·93	87·4	C. G. T.	·72024	8·0464	8·0397	+ ·0067	8·0430	
" "	14 39	2·6872	0·57	90·0	23·28	88·0	19 52 55	10 6 2	90·8	23·67	87·8	C. G. T.	·71861	8·0650	8·0523	+ ·0127	8·0586	
" 26	12 15	2·6870	0·77	91·8	23·59	89·6	19 53 34	10 4 30	92·6	23·36	89·9	R. S.	·71827	8·0629	8·0623	+ ·0006	8·0626	
" "	14 18	2·6881	0·60	90·7	23·00	90·1	19 53 54	10 4 44	92·3	23·22	90·0	R. S.	·71822	8·0584	8·0571	+ ·0013	8·0577	
JUNE 2	12 34	2·6867	0·68	91·7	24·22	90·0	19 47 57	10 1 47	93·7	24·01	90·5	C. G. T.	·71687	8·0811	8·0803	+ ·0008	8·0807	8·0683
" "	14 40	2·6899	0·73	92·4	23·48	91·0	19 48 25	10 2 7	93·8	23·73	90·9	C. G. T.	·71642	8·0704	8·0689	+ ·0015	8·0696	
" 9	12 11	2·6901	0·67	89·9	23·79	88·7	19 49 49	10 2 32	90·7	23·70	89·0	R. S.	·71610	8·0661	8·0662	− ·0001	8·0661	
" "	14 8	2·6906	0·61	90·9	23·05	89·5	19 50 14	10 2 40	91·3	23·40	89·4	R. S.	·71642	8·0637	8·0644	− ·0007	8·0640	
" 16	12 18	2·6895	0·74	90·8	24·19	89·0	19 48 10	10 1 49	91·9	24·11	89·7	C. G. T.	·71604	8·0730	8·0726	+ ·0004	8·0728	
" "	14 20	2·6908	0·71	91·7	23·68	90·0	19 48 15	10 2 10	92·2	23·84	89·9	C. G. T.	·71595	8·0693	8·0668	+ ·0025	8·0680	
" 23	12 28	2·6897	0·69	82·2	25·01	85·5	19 49 37	10 2 25	85·8	24·83	85·1	R. S.	·71533	8·0657	8·0661	− ·0004	8·0659	
" "	14 23	2·6902	0·68	83·9	24·72	85·4	19 49 35	10 2 29	85·7	24·83	85·2	R. S.	·71526	8·0661	8·0659	+ ·0002	8·0660	
" 30	12 5	2·6916	0·76	90·0	23·30	86·8	19 48 40	10 2 7	90·0	23·50	87·1	C. G. T.	·71551	8·0659	8·0651	+ ·0008	8·0655	
" "	14 37	2·6914	0·74	89·9	23·05	87·2	19 48 50	10 2 30	90·3	23·41	87·3	C. G. T.	·71577	8·0657	8·0629	+ ·0028	8·0643	
JULY 7	13 26	2·6898	0·83	90·7	23·76	88·8	19 48 37	10 1 46	91·0	23·67	88·9	R. S.	·71584	8·0711	8·0726	− ·0015	8·0718	8·0695
" "	14 52	2·6902	0·69	90·0	23·37	89·0	19 48 30	10 1 45	90·9	23·52	89·0	R. S.	·71579	8·0702	8·0713	− ·0011	8·0707	
" 14	12 38	2·6922	0·67	82·9	25·11	83·6	19 45 32	10 0 32	84·8	25·08	83·6	F. C.	·71334	8·0732	8·0728	+ ·0004	8·0730	
" "	15 24	2·6932	0·72	81·8	24·17	83·0	19 45 57	10 0 56	84·8	24·93	83·8	F. C.	·71363	8·0680	8·0661	+ ·0019	8·0670	
" 21	12 13	2·6941	0·72	85·0	24·89	83·8	19 45 40	10 0 44	85·7	24·85	84·0	R. S.	·71317	8·0680	8·0666	+ ·0014	8·0673	
" "	14 16	2·6939	0·70	83·8	24·26	84·0	19 46 19	10 0 56	85·1	24·44	84·0	R. S.	·71332	8·0661	8·0655	+ ·0006	8·0658	
" 28	12 13	2·6945	0·61	87·5	24·64	84·3	19 44 42	9 59 47	87·1	24·52	84·8	C. G. T.	·71291	8·0710	8·0728	− ·0018	8·0719	
" "	14 25	2·6951	0·70	87·6	23·97	85·0	19 44 57	10 0 7	87·5	24·28	84·9	C. G. T.	·71311	8·0682	8·0687	− ·0005	8·0684	
AUG. 4	11 21	2·6944	0·74	86·7	24·24	85·0	19 44 15	9 59 57	88·0	24·24	85·5	F. C.	·71299	8·0711	8·0703	+ ·0008	8·0707	
" "	13 49	2·6954	0·81	87·9	23·86	86·0	19 44 17	10 0 0	88·6	24·02	86·0	F. C.	·71311	8·0644	8·0672	− ·0028	8·0658	
" 11	12 46	2·6967	0·74	87·7	23·59	84·8	19 46 10	10 0 43	87·7	23·53	85·1	C. G. T.	·71291	8·0591	8·0595	− ·0004	8·0593	

,,	,,	14 34	2·6968	0·69	88·0	23·62	85·6	19 45 30	10 0 42	88·1	23·56	85·5	C. G. T.	·71280	8·0609	8·0592	+ ·0017	8·0600	8·0633
,,	18	12 1	2·6968	0·69	87·8	24·26	84·9	19 44 42	9 59 45	87·1	24·25	85·1	R. S.	·71236	8·0642	8·0662	− ·0020	8·0652	
,,	,,	14 20	2·6964	0·74	87·3	23·71	85·5	19 44 27	9 59 47	87·4	23·93	85·3	R. S.	·71250	8·0655	8·0666	− ·0011	8·0660	
,,	25	12 8	2·6980	0·67	88·3	23·56	84·6	19 44 34	10 0 2	87·3	23·32	84·7	C. G. T.	·71202	8·0614	8·0612	+ ·0002	8·0613	
,,	,,	14 14	2·6981	0·75	87·5	23·32	85·0	19 45 16	10 0 12	87·6	23·39	85·0	C. G. T.	·71226	8·0576	8·0584	− ·0008	8·0580	
SEPT.	2	12 48	2·6936	0·70	84·8	24·57	83·5	19 41 17	9 58 37	84·3	24·28	83·1	R. S.	·71173	8·0851	8·0833	+ ·0018	8·0842	8·0710
,,	,,	14 44	2·6946	0·76	83·5	23·77	83·2	19 41 36	9 59 3	84·3	24·18	83·0	R. S.	·71191	8·0799	8·0762	+ ·0037	8·0780	
,,	8	12 11	2·6975	0·66	87·2	24·40	84·1	19 41 7	9 58 30	86·9	24·29	84·5	C. G. T.	·71119	8·0736	8·0722	+ ·0014	8·0729	
,,	,,	14 11	2·6984	0·65	87·2	23·65	84·8	19 41 22	9 59 1	87·2	23·99	84·7	C. G. T.	·71135	8·0696	8·0557c	+ ·0139c	8·0626c	
,,	15	12 34	2·6989	0·63	85·9	23·52	84·6	19 42 6	9 59 2	85·9	23·70	84·9	R. S.	·71109	8·0659	8·0642	+ ·0017	8·0650	
,,	,,	14 52	2·6988	0·57	86·5	23·40	85·2	19 42 24	9 59 21	86·3	23·38	85·1	R. S.	·71120	8·0655	8·0627	+ ·0028	8·0641	
,,	22	12 17	2·6974	0·65	86·4	24·46	84·0	19 41 8	9 58 32	85·2	24·51	84·3	C. G. T.	·71111	8·0747	8·0731	+ ·0016	8·0739	
,,	,,	14 16	2·6984	0·67	86·9	23·99	85·0	19 41 20	9 59 0	85·9	24·25	84·8	C. G. T.	·71117	8·0708	8·0668	+ ·0040	8·0688	
,,	29	12 57	2·6976	0·53	83·5	24·45	82·2	19 40 54	9 58 51	83·9	23·93	82·5	R. S.	·71050	8·0738	8·0692	+ ·0046	8·0715	
,,	,,	14 34	2·6986	0·51	84·0	23·88	83·0	19 40 53	9 58 52	84·2	23·85	83·0	R. S.	·71054	8·0710	8·0664	+ ·0046	8·0687	
OCT.	6	12 32	2·6986	0·57	86·7	24·33	83·4	19 41 11	9 58 27	85·6	24·07	83·5	C. G. T.	·71067	8·0710	8·0700	+ ·0010	8·0705	8·0646
,,	,,	14 13	2·6993	0·55	87·2	23·88	83·8	19 41 10	9 58 27	85·9	23·87	83·7	C. G. T.	·71067	8·0691	8·0683	+ ·0008	8·0687	
,,	13	12 55	2·7023	0·57	88·0	24·55	85·0	19 41 16	9 58 9	86·1	24·40	85·2	R. S.	·70982	8·0604	8·0618	− ·0014	8·0611	
,,	,,	14 38	2·7028	0·59	86·3	23·49	85·3	19 41 20	9 58 52	86·2	23·68	85·3	R. S.	·70995	8·0571	8·0540	+ ·0031	8·0555	
,,	20	12 27	2·7001	0·66	87·0	24·72	84·0	19 39 41	9 57 31	86·1	24·38	84·4	C. G. T.	·70980	8·0710	8·0715	− ·0005	8·0712	
,,	,,	14 28	2·7009	0·72	85·0	23·86	84·7	19 40 41	9 57 55	86·0	24·12	84·7	C. G. T.	·70997	8·0635	8·0648	− ·0013	8·0641	
,,	27	12 4	2·7020	0·75	85·9	24·17	84·8	19 40 8	9 57 22	87·8	24·07	85·2	R. S.	·70949	8·0613	8·0642	− ·0029	8·0627	
,,	,,	14 17	2·7022	0·76	87·8	23·38	85·9	19 40 11	9 57 25	87·8	24·01	85·5	R. S.	·70993	8·0620	8·0648	− ·0028	8·0634	
NOV.	2	14 31	2·7016	0·81	87·5	23·88	86·8	19 40 25	9 58 12	88·2	23·34	87·0	P. L.	·70977	8·0624	8·0607	+ ·0017	8·0615	8·0690
,,	,,	16 47	2·7017	0·80	86·9	23·13	86·9	19 39 47	9 58 23	88·6	23·16	87·0	P. L.	·71000	8·0631	8·0581	+ ·0050	8·0606	
,,	4	13 25	2·7021	0·69	90·6	24·07	87·4	19 37 50	9 56 45	90·7	23·88	87·8	R. S.	·70953	8·0700	8·0694	+ ·0006	8·0697	
,,	,,	15 19	2·7022	0·74	89·4	23·46	88·1	19 37 51	9 56 46	90·7	23·63	88·1	R. S.	·70954	8·0683	8·0677	+ ·0006	8·0680	
,,	10	12 43	2·7028	0·71	86·1	24·36	83·4	19 36 12	9 55 54	85·7	23·91	83·9	R. S.	·70799	8·0739	8·0739	·0000	8·0739	
,,	,,	14 41	2·7032	0·63	86·0	23·34	85·3	19 36 17	9 55 57	86·9	23·59	85·0	R. S.	·70828	8·0713	8·0711	+ ·0002	8·0712	
,,	17	12 11	2·7035	0·74	86·1	24·86	83·2	19 36 13	9 55 48	87·2	24·37	83·9	P. L.	·70786	8·0702	8·0709	− ·0007	8·0705	
,,	,,	14 44	2·7034	0·77	88·6	23·27	85·1	19 36 18	9 55 56	88·5	23·69	84·5	P. L.	·70859	8·0713	8·0713	·0000	8·0713	
,,	24	11 51	2·7027	0·60	82·6	25·48	81·5	19 36 32	9 56 5	83·4	25·38	81·8	R. S.	·70783	8·0725	8·0722	+ ·0003	8·0723	
,,	,,	14 27	2·7035	0·58	84·8	24·62	82·9	19 36 35	9 56 9	84·1	25·02	82·2	R. S.	·70804	8·0711	8·0705	+ ·0006	8·0708	
DEC.	1	12 53	2·7066	0·79	86·3	24·30	85·1	19 36 15	9 55 36	86·8	23·97	85·3	C. G. T.	·70703	8·0614	8·0635	− ·0021	8·0624	8·0625
,,	,,	15 10	2·7074	0·66	84·9	23·93	85·5	19 36 10	9 56 5	86·6	23·98	85·6	C. G. T.	·70703	8·0586	8·0571	+ ·0015	8·0578	
,,	8	12 3	2·7088	0·67	84·1	24·61	82·9	19 37 5	9 56 18	84·8	24·56	83·1	R. S.	·70659	8·0522	8·0523	− ·0001	8·0522	
,,	,,	14 24	2·7094	0·68	85·2	24·13	84·3	19 37 4	9 56 20	84·8	24·30	83·9	R. S.	·70661	8·0517	8·0514	+ ·0003	8·0515	
,,	15	12 11	2·7067	0·84	86·7	24·41	83·5	19 35 12	9 55 2	88·0	24·22	84·0	C. G. T.	·70688	8·0637	8·0661	− ·0024	8·0649	
,,	,,	14 35	2·7086	0·85	87·2	23·60	84·6	19 35 50	9 55 50	88·2	23·88	84·2	C. G. T.	·70693	8·0563	8·0554	+ ·0009	8·0558	
,,	22	12 2	2·7032	0·78	82·9	26·08	79·9	19 35 22	9 55 26	83·4	25·78	80·7	R. S.	·70726	8·0747	8·0750	− ·0003	8·0748	
,,	,,	14 30	2·7051	0·78	84·8	24·93	81·8	19 35 25	9 55 34	84·3	25·22	81·4	R. S.	·70724	8·0698	8·0692	+ ·0006	8·0695	
,,	29	12 20	2·7053	0·96	83·7	25·03	80·4	19 34 51	9 55 20	85·1	24·94	80·8	C. G. T.	·70684	8·0699	8·0681	+ ·0018	8·0690	
,,	,,	14 27	2·7051	0·83	83·0	24·98	81·3	19 35 21	9 55 32	84·9	25·03	81·2	C. G. T.	·70703	8·0678	8·0672	+ ·0006	8·0675	

The mean value of the Horizontal Force for the year 1869 = 8·0650

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b. Corrected for rate of Chronometer.

c. Owing to an error in the reductions, which was not discovered till after the table was completed, the numbers for September 8, in columns 16, 17, and 18, should be 8·0657; + ·0039; and 8·0676 respectively. Consequently the mean value of X for September should be 8·0715, but the mean for the year will be unaffected.

Absolute Magnetical Observations.—Table XIII.

Observations of Vibration and Deflection, taken with the Kew Unifilar Magnetometer (No. 23, by Elliott Brothers) for the determination of Absolute Horizontal Force.

1870.

1870.		MAGNET N 23 a.				Corresponding Mean Reading of L. H. F. Magnetometer.		Angle of Deflection of Magnet N 23 c by N 23 a at			Corresponding Mean Reading of L. H. F. Magnetometer.			CALCULATED RESULTS IN ENGLISH UNITS.					
Date.	Civil Time. Mean.	Time of one Vibration. b.	Effect of 90° Torsion.	Temperature.	Rate of Chronometer.	Scale Reading.	Thermometer.	Distance 0·8 foot.	Distance 1·0 foot.	Temperature.	Scale Reading.	Thermometer.	Observer.	Values of m.	Values of X. From Deflections at distance 0·8 foot. ($X_{0·8}$)	Values of X. From Deflections at distance 1·0 foot. ($X_{1·0}$)	Values of X. Difference. $X_{0·8} - X_{1·0}$	Values of X. Mean. $\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1	2	3	4	5	5 A	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s.	Sc. divs.	°	s.		°	° ′ ″	° ′ ″	°									
JAN. 5	12 49	2·7055	0·91	79·2	+ 4·4	24·60	77·1	19 38 27	9 56 58	79·8	24·24	78·2	R. S.	·70700	8·0577	8·0581	− ·0004	8·0579	8·0655
„ „	14 57	2·7058	0·82	80·3	„	23·97	79·4	19 39 4	9 57 6	79·7	24·11	79·1	R. S.	·70728	8·0558	8·0573	− ·0015	8·0565	
„ 12	12 16	2·7056	0·98	81·3	+ 5·0	25·51	77·8	19 35 12	9 55 15	83·1	25·38	78·2	C. G. T.	·70650	8·0670	8·0681	− ·0011	8·0675	
„ „	14 38	2·7067	0·95	83·2	„	24·99	79·1	19 35 16	9 55 36	83·2	25·16	78·9	C. G. T.	·70658	8·0649	8·0638	+ ·0011	8·0643	
„ 19	11 49	2·7030	0·90	76·4	+ 5·2	26·40	75·1	19 35 22	9 55 21	78·9	26·35	76·2	R. S.	·70663	8·0738	8·0748	− ·0010	8·0743	
„ „	14 1	2·7056	0·81	78·8	„	25·80	77·5	19 35 24	9 55 27	78·6	26·06	77·1	R. S.	·70620	8·0684	8·0688	− ·0004	8·0686	
„ 26	12 3	2·7055	0·70	83·0	+ 4·4	25·79	79·0	19 35 12	9 55 28	83·8	25·76	79·3	C. G. T.	·70684	8·0683	8·0679	+ ·0004	8·0681	
„ „	14 15	2·7059	0·76	82·9	„	25·66	80·0	19 35 7	9 55 24	83·8	25·75	80·0	C. G. T.	·70672	8·0673	8·0671	+ ·0002	8·0672	
FEB. 2	12 2	2·7082	0·76	81·8	+ 4·3	24·29	78·2	19 35 36	9 55 41	82·7	24·19	79·1	R. S.	·70609	8·0590	8·0584	+ ·0006	8·0587	8·0670
„ „	14 22	2·7093	0·74	80·8	„	23·63	79·8	19 35 57	9 55 50	82·7	23·90	79·3	R. S.	·70588	8·0536	8·0532	+ ·0004	8·0534	
„ 9	12 39	2·7072	0·91	82·4	+ 3·9	25·56	79·0	19 34 1	9 54 45	83·2	25·53	79·0	C. G. T.	·70586	8·0668	8·0673	− ·0005	8·0670	
„ „	14 34	2·7076	1·00	83·0	„	24·91	79·1	19 34 59	9 55 12	83·3	25·13	79·0	C. G. T.	·70619	8·0629	8·0634	− ·0005	8·0631	
„ 16	12 0	2·7064	0·95	84·9	+ 4·2	25·96	81·4	19 31 12	9 53 20	85·3	25·75	82·4	R. S.	·70557	8·0787	8·0794	− ·0007	8·0790	
„ „	14 11	2·7069	1·03	84·9	„	24·44	84·2	19 31 13	9 53 26	87·1	24·99	83·8	R. S.	·70589	8·0753	8·0755	− ·0002	8·0754	
„ 23	12 12	2·7074	0·94	83·7	+ 4·7	25·70	79·9	19 32 15	9 53 52	84·1	25·57	80·3	C. G. T.	·70544	8·0723	8·0731	− ·0008	8·0727	
„ „	14 19	2·7084	0·90	84·4	„	24·75	82·0	19 32 40	9 54 29	84·8	25·02	81·6	C. G. T.	·70568	8·0681	8·0658	+ ·0023	8·0669	
MARCH 2	12 29	2·7041	0·85	85·6	+ 4·6	25·53	82·5	19 31 15	9 53 35	85·2	25·38	83·4	R. S.	·70635	8·0863	8·0856	+ ·0007	8·0859	8·0758
„ „	14 47	2·7043	1·03	86·0	„	24·56	85·0	19 31 18	9 53 44	86·3	24·95	84·5	R. S.	·70663	8·0846	8·0830	+ ·0016	8·0838	
„ 9	12 1	2·7071	0·84	85·0	+ 4·6	25·57	81·3	19 31 11	9 53 28	84·7	25·40	81·8	C. G. T.	·70541	8·0776	8·0774	+ ·0002	8·0775	
„ „	14 16	2·7082	0·82	85·2	„	24·69	82·6	19 31 27	9 53 35	85·1	25·04	82·3	C. G. T.	·70544	8·0733	8·0731	+ ·0002	8·0732	
„ 16	11 48	2·7062	0·99	85·5	+ 3·8	26·31	82·7	19 29 7	9 52 31	85·7	26·05	83·1	R. S.	·70508	8·0863	8·0856	+ ·0007	8·0859	
„ „	14 4	2·7073	0·90	83·9	„	24·96	83·6	19 29 19	9 52 47	86·1	25·44	83·5	R. S.	·70518	8·0807	8·0789	+ ·0018	8·0798	
„ 23	13 25	2·7083	0·97	85·1	+ 4·8	24·60	83·2	19 32 40	9 54 22	85·6	24·44	83·2	C. G. T.	·70559	8·0679	8·0666	+ ·0013	8·0672	
„ „	14 55	2·7095	0·89	85·6	„	24·10	83·5	19 33 21	9 54 37	85·9	24·31	83·3	C. G. T.	·70570	8·0625	8·0616	+ ·0009	8·0620	
„ 30	12 2	2·7087	0·87	85·8	+ 4·3	25·42	83·3	19 31 8	9 53 11	85·8	25·13	83·7	R. S.	·70495	8·0725	8·0740	− ·0015	8·0732	
„ „	14 17	2·7091	1·15	83·9	„	24·59	84·9	19 31 5	9 53 6	86·3	24·84	84·3	R. S.	·70489	8·0690	8·0709	− ·0019	8·0699	

April	6	12 40	2·7115	1·11	86·7	+ 3·3	23·92	84·2	19 32 52	9 54 11	86·9	23·58	84·6	C. G. T.	·70487	8·0577	8·0582	− ·0005	8·0579	8·0697
,,	,,	14 45	2·7138	1·26	87·4	,,	22·50	85·0	19 33 26	9 54 45	87·1	22·90	84·9	C. G. T.	·70490	8·0491	8·0477	+ ·0014	8·0484	
,,	13	11 53	2·7101	0·86	86·8	+ 3·2	25·39	83·8	19 28 24	9 51 51	87·9	25·05	84·5	R. S.	·70401	8·0761	8·0774	− ·0013	8·0767	
,,	,,	14 3	2·7104	0·95	87·4	,,	24·19	85·6	19 28 40	9 51 58	88·8	24·72	85·4	R. S.	·70451	8·0740	8·0757	− ·0017	8·0748	
,,	20	11 58	2·7104	0·88	88·2	+ 2·5	25·23	86·4	19 27 57	9 52 9	88·1	24·80	86·5	C. G. T.	·70400	8·0779	8·0757	+ ·0022	8·0768	
,,	,,	14 4	2·7112	0·92	87·7	,,	23·91	86·3	19 28 37	9 52 34	88·2	24·28	86·6	C. G. T.	·70440	8·0727	8·0699	+ ·0028	8·0713	
,,	27	12 18	2·7101	0·84	88·1	+ 3·2	25·22	86·2	19 28 15	9 51 52	88·2	24·95	86·8	C. G. T.	·70414	8·0776	8·0783	− ·0007	8·0779	
,,	,,	14 31	2·7112	0·80	88·4	,,	24·28	87·7	19 28 21	9 51 57	88·7	24·53	87·2	C. G. T.	·70416	8·0738	8·0744	− ·0006	8·0741	
May	4	12 7	2·7102	0·86	88·1	+ 3·0	25·42	86·1	19 27 44	9 51 43	89·0	25·18	86·8	C. G. T.	·70411	8·0781	8·0783	− ·0002	8·0782	8·0706
,,	,,	14 33	2·7110	0·91	88·4	,,	24·41	87·1	19 28 0	9 52 2	89·3	24·67	87·0	C. G. T.	·70427	8·0750	8·0738	+ ·0012	8·0744	
,,	11	12 21	2·7139	0·91	89·8	+ 3·9	25·67	86·5	19 28 2	9 51 36	89·7	25·41	86·9	P. L. D.	·70330	8·0671	8·0690	− ·0019	8·0680	
,,	,,	14 50	2·7145	0·95	90·3	,,	24·60	87·5	19 28 12	9 51 43	90·0	25·06	87·2	P. L. D.	·70357	8·0647	8·0664	− ·0017	8·0655	
,,	18	12 12	2·7126	0·85	89·4	+ 3·1	24·63	87·0	19 27 34	9 51 23	90·7	24·48	87·6	C. G. T.	·70362	8·0710	8·0729	− ·0019	8·0719	
,,	,,	14 29	2·7135	0·80	89·9	,,	23·88	88·0	19 27 48	9 51 32	91·2	24·04	88·0	C. G. T.	·70367	8·0677	8·0694	− ·0017	8·0685	
,,	25	12 7	2·7135	0·86	91·3	+ 3·0	24·62	88·7	19 27 40	9 51 37	91·4	24·52	88·9	P. L. D.	·70367	8·0692	8·0697	− ·0005	8·0694	
,,	,,	14 39	2·7137	0·79	91·8	,,	23·66	89·7	19 27 44	9 51 42	91·7	24·19	89·1	P. L. D.	·70400	8·0686	8·0688	− ·0002	8·0687	
June	1	12 33	2·7124	0·83	91·8	+ 3·0	24·61	90·1	19 25 35	9 50 49	92·2	24·46	90·6	C. G. T.	·70354	8·0790	8·0781	+ ·0009	8·0785	8·0818
,,	,,	14 58	2·7134	0·94	91·0	,,	23·78	91·0	19 26 16	9 51 13	92·3	24·04	91·0	C. G. T.	·70359	8·0729	8·0716	+ ·0013	8·0722	
,,	8	11 18	2·7108	0·91	86·2	+ 0·9	25·17	87·4	19 26 23	9 51 8	87·0	25·15	87·9	R. S.	·70335	8·0807	8·0803	+ ·0004	8·0805	
,,	,,	13 36	2·7117	0·89	87·2	,,	24·69	88·0	19 26 39	9 51 14	87·0	24·87	88·0	R. S.	·70335	8·0781	8·0779	+ ·0002	8·0780	
,,	15	12 5	2·7132	0·80	88·4	− 0·1	24·22	87·0	19 26 30	9 51 2	88·1	24·26	87·5	C. G. T.	·70301	8·0744	8·0750	− ·0006	8·0747	
,,	,,	14 28	2·7134	0·90	90·1	,,	23·98	88·0	19 26 1	9 50 40	88·5	24·09	87·7	C. G. T.	·70291	8·0764	8·0779	− ·0015	8·0771	
,,	22	11 54	2·7108	0·88	83·8	− 0·5	25·74	83·0	19 25 2	9 49 55	84·3	25·71	83·3	R. S.	·70238	8·0856	8·0889	− ·0033	8·0872	
,,	,,	14 17	2·7111	0·89	85·0	,,	25·18	83·9	19 25 0	9 50 3	85·0	25·40	83·8	R. S.	·70257	8·0852	8·0874	− ·0022	8·0863	
,,	29	12 4	2·7135	0·95	88·8	+ 0·2	26·25	85·9	19 18 45	9 47 18	88·0	26·16	86·1	C. G. T.	·70060	8·0995	8·0995	·0000	8·0995	
,,	,,	14 44	2·7167	0·97	88·8	,,	24·58	86·6	19 19 57	9 48 30	88·3	24·83	86·5	C. G. T.	·70050	8·0857	8·0816	+ ·0041	8·0836	
July	6	12 52	2·7185	1·05	83·9	− 0·1	24·88	83·2	19 23 16	9 49 24	83·2	24·58	83·0	R. S.	·69970	8·0694	8·0703	− ·0009	8·0698	8·0756
,,	,,	15 0	2·7189	0·98	82·1	,,	24·14	82·4	19 23 23	9 49 28	82·3	24·26	82·7	R. S.	·69970	8·0673	8·0683	− ·0010	8·0678	
,,	13	12 13	2·7161	0·79	83·6	− 0·6	26·16	81·9	19 20 27	9 48 5	84·9	25·63	82·0	C. G. T.	·69957	8·0846	8·0850	− ·0004	8·0848	
,,	,,	14 36	2·7187	0·76	82·3	,,	24·84	81·8	19 22 20	9 49 2	82·8	25·20	82·0	C. G. T.	·69966	8·0714	8·0718	− ·0004	8·0716	
,,	20	12 13	2·7162	0·86	81·0	− 1·7	25·87	81·5	19 21 35	9 48 56	81·5	25·65	81·4	R. S.	·69962	8·0813	8·0796	+ ·0017	8·0804	
,,	,,	14 34	2·7179	0·89	82·0	,,	25·16	81·5	19 22 20	9 49 7	81·9	25·37	81·2	R. S.	·69965	8·0742	8·0738	+ ·0004	8·0740	
,,	27	12 13	2·7169	0·88	82·9	− 3·3	25·67	82·3	19 20 40	9 48 16	84·7	25·48	82·7	C. G. T.	·69955	8·0807	8·0805	+ ·0002	8·0806	
,,	,,	14 38	2·7181	0·88	83·9	,,	24·89	82·9	19 21 15	9 48 27	85·1	25·19	82·9	C. G. T.	·69970	8·0755	8·0763	− ·0008	8·0759	
Aug.	3	12 35	2·7181	0·81	85·2	− 2·2	25·11	82·9	19 20 44	9 48 15	85·1	25·02	83·1	C. G. T.	·69949	8·0785	8·0789	− ·0004	8·0787	8·0768
,,	,,	15 3	2·7213	0·75	86·0	,,	23·65	83·3	19 21 57	9 48 56	85·2	24·47	83·5	C. G. T.	·69960	8·0658	8·0655	+ ·0003	8·0656	
,,	10	12 10	2·7184	0·65	86·0	− 2·1	25·46	83·0	19 20 4	9 48 0	85·8	25·30	83·1	C. G. T.	·69936	8·0803	8·0802	+ ·0001	8·0802	
,,	,,	14 28	2·7194	0·77	85·4	,,	24·73	83·3	19 20 22	9 48 12	85·9	24·95	83·5	C. G. T.	·69934	8·0757	8·0750	+ ·0007	8·0753	
,,	17	12 8	2·7174	0·91	83·9	− 0·4	25·99	83·0	19 19 3	9 47 28	83·8	25·86	83·4	R. S.	·69900	8·0865	8·0865	·0000	8·0865	
,,	,,	14 13	2·7179	0·94	84·7	,,	25·04	84·0	19 20 1	9 47 42	84·8	25·43	83·8	R. S.	·69944	8·0815	8·0831	− ·0016	8·0823	
,,	24	12 7	2·7189	0·64	83·5	− 1·2	25·17	81·9	19 20 59	9 48 18	83·2	25·02	82·2	C. G. T.	·69908	8·0763	8·0770	− ·0007	8·0766	
,,	,,	14 34	2·7199	0·58	84·2	,,	24·24	83·0	19 21 29	9 48 43	83·9	24·51	82·7	C. G. T.	·69931	8·0718	8·0712	+ ·0006	8·0715	
,,	31	12 8	2·7190	0·60	82·1	− 1·4	25·59	81·3	19 20 25	9 48 7	82·9	25·41	81·8	R. S.	·69880	8·0770	8·0770	·0000	8·0770	
,,	,,	14 28	2·7197	0·63	83·3	,,	24·78	82·1	19 20 51	9 48 14	83·4	25·00	82·2	R. S.	·69900	8·0738	8·0748	− ·0010	8·0743	
Sept.	7	12 5	2·7212	0·60	88·4	− 0·2	24·32	84·4	19 20 52	9 48 15	87·3	24·14	84·8	C. G. T.	·69915	8·0703	8·0710	− ·0007	8·0706	
,,	,,	14 32	2·7214	0·69	86·5	,,	23·08	84·7	19 21 37	9 48 46	87·4	23·57	84·7	C. G. T.	·69954	8·0655	8·0651	+ ·0004	8·0653	

b. Uncorrected for rate of Chronometer.

1870.		Magnet N 23 a.				Corresponding Mean Reading of L. H. F. Magnetometer.		Angle of Deflection of Magnet N 23 c by N 23 a at			Corresponding Mean Reading of L. H. F. Magnetometer.			Calculated Results in English Units.					
								Distance.							Values of X.				
															From Deflections at distance		Difference.	Mean.	
Date.	Civil Time. Mean.	Time of one Vibration. b.	Effect of 90° Torsion.	Temperature.	Rate of Chronometer.	Scale Reading.	Thermometer.	0·8 foot.	1·0 foot.	Temperature.	Scale Reading.	Thermometer.	Observer.	Values of m.	0·8 foot. ($X_{0·8}$)	1·0 foot. ($X_{1·0}$)	$X_{0·8} - X_{1·0}$	$\frac{X_{0·8} + X_{1·0}}{2}$	Monthly Mean Values of X.
1	2	3	4	5	5 A	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	h. m.	s	Sc. div.	°	s		°	° ′ ″	° ′ ″	°									
Sept. 14	12 51	2·7199	0·59	86·8	− 0·6	25·25	84·0	19 19 59	9 47 50	86·3	24·89	84·2	R. S.	·69894	8·0766	8·0774	− ·0008	8·0770	8·0700
,, ,,	15 4	2·7206	0·58	86·2	,,	24·37	84·4	19 19 31	9 47 35	86·5	24·55	84·7	R. S.	·69888	8·0755	8·0763	− ·0008	8·0759	
,, 21	12 6	2·7218	0·69	82·4	− 0·2	24·56	82·0	19 20 21	9 47 52	82·5	24·08	82·3	C. G. T.	·69781	8·0694	8·0709	− ·0015	8·0701	
,, ,,	14 34	2·7227	0·70	83·1	,,	22·56	82·9	19 20 33	9 47 57	82·7	23·35	82·7	C. G. T.	·69831	8·0664	8·0681	− ·0017	8·0672	
,, 28	11 51	2·7276	0·60	86·1	− 0·2	24·49	83·1	19 15 16	9 45 37	85·8	24·53	83·2	R. S.	·69573	8·0696	8·0694	+ ·0002	8·0695	
,, ,,	14 13	2·7282	0·59	86·2	,,	23·73	83·9	19 15 59	9 45 52	86·8	24·02	83·9	R. S.	·69595	8·0644	8·0649	− ·0005	8·0646	
Oct. 5	12 51	2·7255	0·59	86·5	− 0·8	24·87	83·5	19 15 52	9 45 40	84·3	24·59	83·6	C. G. T.	·69610	8·0753	8·0768	− ·0015	8·0760	8·0687
,, ,,	14 59	2·7274	0·58	84·9	,,	24·22	83·2	19 16 20	9 46 26	84·3	24·34	83·4	C. G. T.	·69602	8·0668	8·0647	+ ·0021	8·0657	
,, 12	11 59	2·7258	0·67	87·7	− 1·4	25·13	83·9	19 14 45	9 45 11	86·8	25·07	83·9	R. S	·69611	8·0768	8·0779	− ·0011	8·0773	
,, ,,	14 22	2·7263	0·59	86·2	,,	24·01	85·0	19 15 35	9 45 36	87·6	24·32	84·9	R. S.	·69639	8·0707	8·0718	− ·0011	8·0712	
,, 19	12 4	2·7268	0·69	90·0	− 1·7	24·29	86·8	19 13 42	9 45 8	88·1	24·24	86·2	C. G. T.	·69591	8·0781	8·0761	+ ·0020	8·0771	
,, ,,	14 27	2·7278	0·73	88·7	,,	23·64	87·0	19 14 39	9 45 36	90·0	23·97	86·8	C. G. T.	·69621	8·0692	8·0671	+ ·0021	8·0681	
,, 27	15 14	2·7286	0·93	86·4	+ 0·9	23·64	84·9	19 17 13	9 46 30	86·6	23·44	84·8	R. S.	·69594	8·0590	8·0593	− ·0003	8·0591	
,, ,,	16 45	2·7289	0·85	83·7	,,	23·36	84·0	19 17 43	9 46 40	86·3	23·35	84·4	R. S.	·69589	8·0545	8·0555	− ·0010	8·0550	
Nov. 2	12 8	2·7266	0·82	86·3	+ 3·0	25·69	81·9	19 14 37	9 45 19	84·7	25·36	82·6	C. G. T.	·69557	8·0757	8·0753	+ ·0004	8·0755	8 0680
,, ,,	14 31	2·7273	0·88	84·6	,,	24·70	83·8	19 15 57	9 45 50	85·2	24·89	83·2	C. G. T.	·69582	8·0671	8·0679	− ·0008	8·0675	
,, 9	12 32	2·7291	0·97	86·0	+ 2·4	23·85	84·0	19 17 42	9 46 56	85·6	23·34	83·9	R. S.	·69573	8·0566	8·0556	+ ·0010	8·0561	
,, ,,	14 55	2·7297	1·02	84·9	,,	22·31	84·3	19 18 55	9 47 26	86·1	22·60	84·1	R. S.	·69626	8·0493	8·0490	+ ·0003	8·0491	
,, 16	12 33	2·7269	1·00	88·0	+ 3·3	25·05	83·9	19 13 47	9 44 55	87·4	24·90	84·6	C. G. T.	·69566	8·0763	8·0761	+ ·0002	8·0762	
,, ,,	14 54	2·7284	0·91	87·7	,,	24·31	85·9	19 14 14	9 45 12	88·8	24·44	85·4	C. G. T.	·69557	8·0690	8·0683	+ ·0007	8·0686	
,, 23	12 2	2·7271	1·10	86·9	+ 3·8	24·70	84·1	19 15 17	9 45 57	87·7	24·34	84·3	R. S.	·69592	8·0694	8·0670	+ ·0024	8·0682	
,, ,,	14 27	2·7279	0·96	86·4	,,	23·65	84·3	19 15 50	9 45 58	88·3	23·89	84·3	R. S.	·69613	8·0644	8·0638	+ ·0006	8·0641	
,, 30	12 2	2·7264	0·96	87·7	+ 4·1	25·55	83·3	19 13 21	9 44 25	88·0	25·40	83·9	C. G. T.	·69560	8·0785	8·0802	− ·0017	8·0793	
,, ,,	14 26	2·7276	0·99	88·0	,,	24·73	84·0	19 13 31	9 44 27	88·6	25·04	84·0	C. G. T.	·69558	8·0742	8·0761	− ·0019	8·0751	
Dec. 7	11 45	2·7258	0·94	87·6	+ 4·7	25·79	83·0	19 12 40	9 43 51	87·6	25·71	83·4	R. S.	·69550	8·0831	8·0863	− ·0032	8·0847	8·0787
,, ,,	14 4	2·7263	0·92	87·3	,,	24·93	84·2	19 13 33	9 44 42	88·0	25·12	84·1	R. S.	·69586	8·0781	8·0785	− ·0004	8·0783	
,, 14	11 51	2·7282	1·07	85·5	+ 5·5	26·14	81·2	19 7 46	9 42 2	86·7	25·95	82·0	C. G. T.	·69336	8·0913	8·0904	+ ·0009	8·0908	
,, ,,	14 42	2·7333	0·94	87·2	,,	24·83	83·5	19 9 7	9 42 49	87·9	25·09	83·1	C. G. T.	·69287	8·0722	8·0705	+ ·0017	8·0713	
,, 21	12 4	2·7304	1·25	85·9	+ 5·4	25·74	81·9	19 10 35	9 43 6	85·7	25·60	82·1	C. G. T.	·69341	8·0761	8·0774	− ·0013	8·0767	
,, ,,	14 28	2·7316	1·39	84·0	,,	25·15	83·0	19 10 41	9 43 12	85·7	25·31	82·9	C. G. T.	·69314	8·0705	8·0714	− ·0009	8·0709	
,, 28	12 6	2·7287	1·39	81·8	+ 5·8	26·11	80·8	19 10 13	9 42 51	83·6	25 94	81·2	C. G. T.	·69323	8·0807	8·0824	− ·0017	8·0815	
,, ,,	14 27	2·7311	1·53	85·0	,,	25·37	82·2	19 10 29	9 43 1	83·9	25·50	81·9	C. G. T.	·69305	8·0750	8·0764	− ·0014	8·0757	

The mean Value of the Horizontal Force for the year 1870 = 8·0723

b. Uncorrected for rate of Chronometer.

Absolute Magnetical Observations.—Table XIV.

OBSERVATIONS OF ABSOLUTE DECLINATION, 1867 TO 1870.

June to December 1867.

1867.		Mean Readings.				Torsion.				Monthly Mean		
Date.	Bombay Civil Time.	Collimator Magnet. Scale apparently Erect.	Collimator Magnet. Scale apparently Inverted.	Horizontal Circle with Telescope pointed to Scale of Collimator Magnet.	Horizontal Circle with Telescope pointed to Tardeo Chimney.	Mean.	Effect of 90°.	Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination corrected for Torsion.	Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination.	Observer.
1	2	3	4	5	6	7	8	9	10	11	12	13
	h. m.	Sc. div.	Sc. div.	° ′ ″	° ′ ″	°	Sc. div.	Sc. div.	° ′ ″	Sc. div.	° ′ ″	
June 27	12 49	+ 0·15	+ 1·00	17 10 35	196 54 30	32 E.	0·26	34·83	0 41 20	34·86	0 41 34	C. G. T.
„ „	14 25	+ 0·24	+ 0·85	17 10 30	196 54 40	32 E.	0·26	34·87	0 41 22			C. C.
July 8	13 35	− 0·19	+ 3·25	17 13 5	196 54 17	15 W.	0·25	34·85	0 41 23			C.C.&C.G.T.
„ 11	12 18	+ 0·02	+ 3·05	17 12 55	196 54 15	5 E.	0·28	34·78	0 41 35			C. G. T.
„ 18	12 10	− 0·17	+ 3·32	17 13 42	196 55 17	4 W.	0·27	34·85	0 40 52			C. G. T.
„ 25	11 44	− 0·05	+ 2·60	17 14 52	196 55 22	0		34·96	0 42 54			C.G.T.&R.S.
Aug 1	12 8	+ 0·02	+ 3·36	17 13 5	196 55 22	22 E.	0·30	34·76	0 40 9	34·80	0 41 15	R. S.
„ 8	11 7	− 0·07	+ 3·40	17 15 0	196 54 57	4 E.	0·30	34·95	0 42 28			C. G. T.
„ 15	11 21	+ 1·65	+ 1·55	17 11 15	196 55 45	0		34·98	0 42 3			R. S.
„ 22	12 58	+ 1·67	+ 1·75	17 13 22	196 56 35	5 E.	0·38	34·71	0 43 4			R. S.
„ 29	12 23	+ 1·70	+ 1·72	17 9 10	196 57 5	0		34·60	0 38 30			C. G. T.
Sept. 5	12 21	+ 1·70	+ 1·64	17 9 10	196 56 45	0		34·52	0 38 55	34·78	0 41 20	R. S.
„ 12	12 1	+ 1·72	+ 1·70	17 10 15	196 55 20	7 W.	0·64	34·68	0 41 29			C. G. T.
„ 19	11 49	+ 1·70	+ 1·72	17 11 5	196 55 0	3 E.	0·47	34·82	0 42 28			R. S.
„ 26	11 2	+ 1·67	+ 1·37	17 12 55	196 56 15	0		35·12	0 43 27			C. G. T.
Oct. 3	12 24	+ 1·60	+ 1·65	17 12 52	196 56 10	2 W.	0·38	34·90	0 43 6	34·92	0 42 18	R. S.
„ 10	12 54	+ 1·70	+ 1·67	17 12 30	196 56 15	0		34·87	0 42 42			C. G. T.
„ 17	11 50	+ 1·70	+ 1·74	17 10 45	196 55 50	0		34·83	0 41 18			R. S.
„ 24	11 59	+ 1·72	+ 1·80	17 10 15	196 56 10	10 E.	0·34	34·91	0 40 20			C. G. T.
„ 31	11 15	+ 1·76	+ 1·77	17 13 10	196 55 30	0		35·10	0 44 5			R. S.
Nov. 7	11 57	+ 1·70	+ 1·85	17 12 20	196 55 15	11 W.	0·38	34·97	0 43 27	35·08	0 43 38	C. G. T.
„ 16	11 57	+ 1·72	+ 1·75	17 13 10	196 56 10	8 E.	0·34	35·13	0 43 21			R. S.
„ 21	11 3	+ 1·76	+ 2·24	17 15 2	196 56 0	9 W.	0·43	35·11	0 45 1			C. G. T.
„ 28	11 42	+ 2·05	+ 1·86	17 12 5	196 56 0	0		35·10	0 42 43			R. S.
Dec. 5	12 56	+ 2·00	+ 1·95	17 12 0	196 55 10	0		35·19	0 43 19	35·19	0 43 58	C. G. T.
„ 12	11 23	+ 2·00	+ 1·89	17 14 25	196 55 5	0		35·21	0 45 53			R. S.
„ 19	12 24	+ 2·02	+ 2·19	17 14 40	196 57 20	20 E.	0·55	35·11	0 43 17			C. G. T.
„ 24	11 19	+ 2·00	+ 2·32	17 14 32	196 57 10	4 E.	0·59	35·24	0 43 22			R. S.

The Mean Declination for July to December 1867 = 0° 42′ 20″

Absolute Magnetical Observations, Table XV.

Observations of Absolute Declination.

1868.

1868.	Bombay Civil Time.	Mean Readings.				Torsion.		Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination corrected for Torsion.	Monthly Mean		Observer
Date.		Collimator Magnet.		Horizontal Circle with Telescope pointed to		Mean.	Effect of 90°.			Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination.	
		Scale Apparently		Scale of Collimator Magnet.	Tardeo Chimney.							
		Erect.	Inverted.									
1	2	3	4	5	6	7	8	9	10	11	12	13
	h. m.	Sc. div.	Sc. div.	° ′ ″	° ′ ″	°	Sc. div.	Sc. div.	° ′ ″	Sc. div.	° ′ ″	
Jan. 3	12 10	+ 2·05	+ 2·41	17 12 0	196 54 25	0		35·28	0 43 36	35·25	0 44 16	R. S.
„ 9	11 51	+ 2·02	+ 2·34	17 12 25	196 53 37	0		35·25	0 44 52			R. S.
„ 12	11 20	+ 2·00	+ 2·09	17 13 0	196 55 5	10 E.	0·54	35·05	0 44 7			C. G. T.
„ 22	17 6	+ 2·00	+ 2·22	17 14 0	196 56 2	0		35·32	0 44 9			R. S.
„ 30	11 50	+ 2·15	+ 2·10	17 13 20	196 55 12	0		35·34	0 44 37			C. G. T.
Feb. 6	12 34	+ 2·15	+ 2·17	17 11 30	196 55 0	5 E.	0·52	35·02	0 42 51	35·30	0 44 2	R. S.
„ 13	12 22	+ 2·10	+ 2·05	17 11 50	196 55 5	0		35·22	0 43 14			C. G. T.
„ 20	11 56	+ 2·11	+ 2·16	17 13 12	196 55 15	0		35·38	0 44 20			R. S.
„ 27	11 10	+ 2·10	+ 2·20	17 14 40	196 55 15	0		35·58	0 45 44			C. G. T.
Mar. 7	8 19	+ 2·11	+ 2·15	17 13 45	196 54 55	0		35·40	0 45 13	35·32	0 44 56	R. S.
„ 12	12 45	+ 2·12	+ 2·20	17 14 2	196 55 10	0		35·35	0 45 13			C. G. T.
„ 19	12 38	+ 2·05	+ 2·19	17 13 40	196 55 15	0		35·24	0 44 41			R. S.
„ 26	11 42	+ 2·06	+ 2·00	17 13 25	196 55 20	3 W.	0·50	35·30	0 44 37			R. S.
April 2	11 45	+ 2·12	+ 2·12	17 12 15	196 55 20	0		35·15	0 43 21	35·12	0 43 19	R. S.
„ 9	11 1	+ 2·07	+ 2·02	17 13 27	196 55 10	0		35·31	0 44 46			R. S.
„ 16	11 40	+ 2·07	+ 2·22	17 11 45	196 55 15	2 E.	0·55	35·05	0 42 44			R. S.
„ 23	11 41	+ 2·15	+ 2·07	17 11 40	196 55 5	0		34·99	0 43 6			R. S.
„ 30	13 7	+ 2·24	+ 2·01	17 11 15	[196 55 20]	0		35·08	0 42 36			R. S.
May 7	12 26	+ 2·12	+ 2·07	17 10 27	196 55 5	0		34·97	0 41 51	35·12	0 42 27	R. S.
„ 14	13 8	+ 2·12	+ 2·00	17 11 17	196 55 15	0		35·14	0 42 36			R. S.
„ 21	12 15	+ 2·10	+ 2·05	17 10 42	196 55 25	0		35·09	0 41 46			R. S.
„ 28	11 41	+ 2·00	+ 2·00	17 12 20	196 55 17	5 W.	1·02	35·30	0 43 37			R. S.
June 4	12 36	+ 2·12	+ 2·15	17 10 32	196 55 25	0		34·96	0 41 32	35·07	0 42 24	R. S.
„ 11	11 58	+ 2·10	+ 2·15	17 11 0	196 55 25	0		34·98	0 41 58			R S.
„ 18	11 47	+ 2·07	+ 2·05	17 11 45	196 55 25	7 W.	1·25	35·10	0 43 0			R. S.
„ 25	11 48	+ 2·10	+ 2·00	17 12 12	196 55 40	0		35·24	0 43 5			C. G. T.
July 2	11 53	+ 2·01	+ 2·21	17 12 37	196 56 0	0		35·12	0 42 49	35·25	0 43 24	R. S.
„ 9	11 27	+ 2·10	+ 2·21	17 14 2	196 55 57	0		35·42	0 44 24			C. G. T.
„ 16	11 45	+ 2·10	+ 2·20	17 12 22	196 55 55	0		35·18	0 42 46			R. S.
„ 23	11 34	+ 2·10	+ 2·21	17 13 55	196 55 55	0		35·36	0 44 19			C. G. T.
„ 30	11 52	+ 2·20	+ 2·10	17 12 2	196 55 55	0		35·15	0 42 40			R. S.
Aug. 6	11 27	+ 2·15	+ 2·19	17 13 50	196 55 55	0		35·29	0 44 18	35·21	0 43 39	C. G. T.
„ 13	11 25	+ 2·10	+ 2·17	17 13 45	196 55 55	0		35·22	0 44 12			C. G. T.
„ 20	11 26	+ 2·14	+ 2·12	17 11 45	196 55 50	0		35·03	0 42 22			C. G. T.
„ 27	11 48	+ 2·26	+ 2·07	17 13 2	196 55 57	0		35·31	0 43 43			R. S.
Sept. 3	11 50	+ 2·10	+ 2·00	17 11 7	196 55 57	9 E.	1·45	35·03	0 41 23	35·14	0 42 31	R. S.
„ 10	11 29	+ 2·10	+ 2·02	17 11 2	196 55 55	0		35·01	0 41 39			C. G. T.
„ 17	11 52	+ 2·07	+ 2·11	17 12 47	196 55 57	0		35·21	0 43 13			R. S.
„ 24	11 56	+ 2·12	+ 2·01	17 13 12	196 55 55	0		35·32	0 43 50			C. G. T.
Oct. 1	11 44	+ 2·07	+ 2·19	17 14 17	196 56 10	7 E.	0·51	35·46	0 44 19	35·47	0 44 51	R. S.
„ 8	12 8	+ 2·05	+ 2·10	17 13 2	196 55 57	0		35·27	0 43 28			R. S.
„ 15	11 38	+ 2·05	+ 2·00	17 14 45	196 56 5	0		35·52	0 45 9			R. S.
„ 22	11 42	+ 2·04	+ 2·00	17 14 57	196 55 45	0		35·54	0 45 41			R. S.
„ 29	11 55	+ 2·07	+ 1·91	17 14 57	196 55 55	2 E.	0·52	35·56	0 45 37			R. S.
Nov. 5	11 17	+ 1·95	+ 2·00	17 14 55	196 56 2	0		35·49	0 45 16	35·59	0 46 4	R. S.
„ 12	11 51	+ 2·05	+ 2·12	17 14 45	196 56 12	0		35·41	0 44 55			C. G. T.
„ 19	11 38	+ 2·10	+ 2·07	17 16 7	196 56 15	0		35·62	0 46 19			C. G. T.
„ 26	11 56	+ 2·17	+ 1·96	17 13 30	196 52 25	0		35·84	0 47 45			C. G. T.
Dec. 3	11 38	+ 2·12	+ 1·89	17 11 55	196 52 35	0		35·53	0 46 1	35·44	0 45 34	C. G. T.
„ 10	11 50	+ 2·10	+ 1·81	17 13 2	196 53 45	0		35·52	0 46 2			R. S.
„ 17	11 50	+ 2·00	+ 1·86	17 11 57	196 53 42	0		35·31	0 44 51			R. S.
„ 24	11 48	+ 2·10	+ 1·90	17 12 57	196 54 0	0		35·47	0 45 37			C. G. T.
„ 31	11 43	+ 2·07	+ 1·90	17 12 25	196 53 45	0		35·36	0 45 17			C. G. T.

The Mean Declination for the year 1868 = 0° 43′ 57″

Absolute Magnetical Observations, Table XVI.

Observations of Absolute Declination.

1869.

1869.		Mean Readings.				Torsion.		Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination corrected for Torsion.	Monthly Mean		Observer
Date.	Bombay Civil Time.	Collimator Magnet. Scale apparently Erect.	Collimator Magnet. Scale apparently Inverted.	Horizontal Circle with Telescope pointed to Scale of Collimator Magnet.	Horizontal Circle with Telescope pointed to Tardeo Chimney.	Mean.	Effect of 90°.			Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination.	
1	2	3	4	5	6	7	8	9	10	11	12	13
	h. m.	Sc. div.	Sc. div.	° ′ ″	° ′ ″	°	Sc. div.	Sc. div.	° ′ ″	Sc. div.	° ′ ″	
Jan. 7	11 41	+ 2.00	+ 1.90	17 12 42	196 53 47	0		35.37	0 45 28	35.55	0 46 15	R. S.
„ 14	13 9	+ 3.74	0.00	17 13 5	196 57 2	0		35.64	0 46 47			C. G. T.
„ 21	11 49	+ 3.46	0.00	17 10 50	[196 55 21]	0		35.60	0 45 54			R. S.
„ 28	11 41	+ 1.92	+ 1.62	17 12 22	196 52 17	0		35.60	0 46 52			C. G. T.
Feb. 4	11 26	+ 1.85	+ 1.84	17 14 22	196 51 45	3 W.	0.72	35.83	0 49 6	35.54	0 46 56	R. S.
„ 11	11 42	+ 1.90	+ 1.77	17 10 37	196 51 55	0		35.34	0 45 16			C. G. T.
„ 18	11 35	+ 1.87	+ 1.65	17 12 57	196 52 12	0		35.65	0 47 26			R. S.
„ 26	11 54	+ 1.87	+ 1.82	17 11 22	196 51 55	0		35.35	0 45 56			C. G. T.
Mar. 4	11 37	+ 1.85	+ 1.74	17 11 20	196 51 42	0		35.39	0 46 11	35.46	0 46 22	R. S.
„ 11	11 43	+ 1.82	+ 1.62	17 11 55	196 51 32	0		35.55	0 47 3			C. G. T.
„ 20	11 15	+ 1.49	+ 1.60	17 11 55	196 51 47	0		35.54	0 46 27			R. S.
„ 25	11 56	+ 1.50	+ 1.50	17 11 17	196 51 55	0		35.36	0 45 48			C. G. T.
April 2	13 33	+ 2.76	+ 0.45	17 9 20	196 55 12	0		35.11	0 43 13	35.28	0 45 7	F. C.
„ 8	11 57	+ 1.50	+ 1.70	17 11 2	196 52 5	0		35.33	0 45 9			C. G. T.
„ 15	11 33	+ 1.54	+ 1.64	17 11 55	196 52 5	0		35.39	0 46 9			R. S.
„ 22	11 33	+ 1.55	+ 1.50	17 10 30	196 52 15	0		35.19	0 44 44			C. G. T.
„ 29	11 33	+ 1.62	+ 1.50	17 11 32	196 51 47	0		35.39	0 46 19			R. S.
May 6	11 32	+ 1.55	+ 1.66	17 11 55	196 52 15	0		35.45	0 45 59	35.38	0 45 26	C. G. T.
„ 13	11 42	+ 1.52	+ 1.65	17 10 47	196 51 55	0		35.36	0 45 10			R. S.
„ 20	11 42	+ 1.57	+ 1.39	17 9 40	196 50 35	0		35.40	0 45 43			C. G. T.
„ 27	11 50	+ 1.46	+ 1.54	17 9 7	196 50 35	0		35.31	0 44 52			R. S.
June 3	11 44	+ 1.50	+ 1.55	17 9 35	196 50 42	0		35.30	0 45 16	35.38	0 45 38	C. G. T.
„ 10	11 38	+ 1.52	+ 1.57	17 9 7	196 50 57	10 E.	0.56	35.24	0 44 24			R. S.
„ 17	11 39	+ 1.51	+ 1.40	17 11 32	196 50 27	0		35.70	0 47 38			C. G. T.
„ 24	12 15	+ 2.52	+ 0.22	17 8 35	[196 52 27]	0		35.28	0 45 13			R. S.
July 1	11 48	+ 1.50	+ 1.42	17 10 20	196 50 52	10 E.	0.73	35.47	0 45 38	35.47	0 45 57	C. G. T.
„ 8	11 49	+ 1.50	+ 1.45	17 10 22	196 50 50	0		35.52	0 46 1			R. S.
„ 15	14 40	+ 1.59	+ 1.41	17 11 0	196 51 37	0		35.49	0 46 1			F. C.
„ 22	11 37	+ 2.49	+ 0.52	17 10 27	[196 52 57]	0		35.37	0 46 11			R. S.
„ 29	11 52	+ 1.47	+ 1.55	17 10 57	196 51 22	0		35.50	0 45 55			C. G. T.
Aug. 5	11 36	+ 1.57	+ 1.40	17 11 45	196 51 35	7 E.	0.59	35.58	0 46 41	35.38	0 45 16	F. C.
„ 12	11 30	+ 1.49	+ 1.62	17 11 2	196 51 45	0		35.33	0 45 35			C. G. T.
„ 19	11 44	+ 1.50	+ 1.57	17 11 0	196 52 10	0		35.37	0 45 12			R. S.
„ 26	11 36	+ 1.50	+ 1.69	17 9 22	196 52 0	0		35.23	0 43 36			C. G. T.
Sept. 3	11 38	+ 1.45	+ 1.82	17 11 35	196 51 55	0		35.49	0 45 41	35.46	0 45 15	R. S.
„ 9	11 44	+ 1.52	+ 1.91	17 8 47	196 52 2	10 W.	0.48	35.10	0 42 52			C. G. T.
„ 16	11 50	+ 1.50	+ 1.79	17 11 30	196 52 27	0		35.43	0 45 10			R. S.
„ 23	11 44	+ 1.60	+ 1.59	17 11 57	196 52 5	0		35.62	0 46 18			C. G. T.
„ 30	12 15	+ 1.50	+ 1.52	17 12 15	196 52 10	22 E.	0.45	35.68	0 46 14			R. S.
Oct. 7	11 47	+ 1.56	+ 1.50	17 11 52	196 52 5	0		35.56	0 46 17	35.62	0 46 29	C. G. T.
„ 14	11 26	+ 1.55	+ 1.50	17 10 5	196 52 12	0		35.35	0 44 22			R. S.
„ 21	11 43	+ 1.54	+ 1.71	17 14 12	196 52 25	0		35.81	0 48 2			C. G. T
„ 28	12 4	+ 1.50	+ 1.56	17 13 10	196 52 17	0		35.75	0 47 15			R. S.
Nov. 5	11 45	+ 1.52	+ 1.66	17 14 2	196 52 7	0		35.86	0 48 11	35.73	0 47 13	P. L.
„ 11	11 46	+ 1.50	+ 1.56	17 12 15	196 52 15	0		35.60	0 46 22			R. S.
„ 18	12 7	+ 1.50	+ 1.61	17 13 30	196 52 20	0		35.80	0 47 29			P. L.
„ 25	11 0	+ 1.49	+ 1.57	17 12 45	196 52 15	0		35.68	0 46 50			R. S.
Dec. 2	11 48	+ 1.54	+ 1.50	17 13 35	196 53 52	0		35.62	0 46 12	35.74	0 47 43	C. G. T.
„ 9	11 50	+ 1.52	+ 1.50	17 14 57	196 53 35	0		35.80	0 47 49			R. S.
„ 16	11 47	+ 1.50	+ 1.54	17 16 35	196 53 30	0		35.80	0 49 28			C. G. T.
„ „	15 37	+ 1.54	+ 1.50	17 15 45	196 53 27	0		35.93	0 48 47			C. G. T.
„ 23	11 34	+ 1.50	+ 1.54	17 14 15	196 53 35	9 W.	0.43	35.67	0 47 9			R. S.
„ 30	11 38	+ 1.50	+ 1.60	17 14 7	196 53 45	10 W.	0.79	35.63	0 46 53			C. G. T.

The mean Declination for the year 1869 = 0° 46′ 8″

Absolute Magnetical Observations.—Table XVII.

Observations of Absolute Declination.

1870.

1870.		Mean Readings.				Torsion.				Monthly Mean		
Date.	Bombay Civil Time.	Collimator Magnet.		Horizontal Circle with Telescope pointed to		Mean.	Effect of 90°.	Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination corrected for Torsion.	Corresponding Reading of large Declination Magnetometer.	Absolute Easterly Declination.	Observer
		Scale Apparently		Scale of Collimator Magnet.	Tardeo Chimney.							
		Erect.	Inverted.									
1	2	3	4	5	6	7	8	9	10	11	12	13
	h. m.	Sc. div	Sc. div.	° ′ ″	° ′ ″	°	Sc. div.	Sc. div.	° ′ ″	Sc. div.	° ′ ″	
Jan. 6	11 41	+ 1·50	+ 1·54	17 12 7	196 53 37	0		35·37	0 44 53	35·70	0 47 9	R. S.
„ 13	11 37	+ 1·50	+ 1·52	17 14 55	196 53 30	7 w.	0·74	35·80	0 47 58			C. G. T.
„ 20	11 24	+ 1·50	+ 1·54	17 14 35	196 53 32	0		35·75	0 47 26			R. S.
„ 27	11 31	+ 1·50	+ 1·52	17 15 20	196 53 27	0		35·89	0 48 18			C. G. T.
Feb. 3	11 36	+ 1·50	+ 1·59	17 13 55	196 53 27	0		35·67	0 46 48	35·73	0 47 4	R. S.
„ 10	11 39	+ 1·50	+ 1·62	17 14 7	196 53 30	0		35·69	0 46 55			C. G. T.
„ 17	11 34	+ 1·50	+ 1·59	17 14 25	196 53 27	0		35·81	0 47 18			R. S.
„ 24	11 34	+ 1·50	+ 1·59	17 14 32	196 53 35	0		35·75	0 47 17			C. G. T.
Mar. 3	11 25	+ 1·44	+ 1·89	17 14 15	196 53 27	0		35·66	0 46 44	35·88	0 48 4	R. S.
„ 10	11 31	+ 1·51	+ 1·80	17 15 57	196 53 27	0		35·95	0 48 37			C. G. T.
„ 18	11 34	+ 1·49	+ 1·71	17 13 2	196 53 35	0		35·46	0 45 38			R. S.
„ 19	15 18	+ 1·60	+ 1·71	17 17 7	196 53 45	7 E.	1·12	36·19	0 49 29			R. S.
„ 24	11 35	+ 1·61	+ 1·75	17 16 22	196 53 25	0		36·02	0 49 13			C. G. T.
„ 31	11 28	+ 1·60	+ 1·80	17 16 2	196 53 30	0		35·98	0 48 44			R. S.
April 7	11 32	+ 1·60	+ 1·75	17 16 27	196 53 25	0		36·06	0 49 18	35·64	0 46 36	C. G. T.
„ 14	11 27	+ 1·60	+ 1·69	17 10 25	196 53 32	0		35·16	0 43 13			R. S.
„ 21	11 30	+ 1·60	+ 1·72	17 14 17	196 53 25	0		35·71	0 47 10			C. G. T.
„ 28	11 31	+ 1·65	+ 1·72	17 13 47	196 53 25	0		35·62	0 46 44			C. G. T.
May 5	11 38	+ 1·70	+ 1·75	17 13 22	196 53 20	0		35·59	0 46 25	35·67	0 47 0	C. G. T.
„ 12	11 33	+ 1·61	+ 1·76	17 13 27	196 53 47	0		35·58	0 45 56			P. L.
„ „	16 40	+ 1·54	+ 1·60	17 15 27	196 53 27	0		35·93	0 48 22			P. L.
„ 19	11 40	+ 1·75	+ 1·82	17 14 17	196 53 12	5 w.	1·03	35·74	0 47 35			C. G. T.
„ 26	11 46	+ 1·61	+ 1·69	17 13 0	196 53 27	0		35·42	0 45 53			P. L.
„ „	15 7	+ 1·60	+ 1·69	17 14 57	196 53 30	0		35·79	0 47 47			P. L.
June 2	11 45	+ 1·66	+ 1·84	17 11 37	196 53 22	0		35·30	0 44 29	35·63	0 46 54	C. G. T.
„ 9	11 28	+ 1·67	+ 1·76	17 14 57	196 53 32	0		35·66	0 47 45			R. S.
„ 16	11 36	+ 1·75	+ 1·62	17 14 47	196 53 10	0		35·78	0 48 11			C. G. T.
„ 23	11 37	+ 1·60	+ 1·51	17 13 15	196 53 12	7 w.	0·97	35·67	0 46 45			R. S.
„ „	14 12	+ 1·62	+ 1·47	17 14 15	196 53 25	0		35·73	0 47 26			R. S.
„ 30	11 49	+ 1·70	+ 1·59	17 13 42	196 53 25	0		35·65	0 46 50			C. G. T.
July 7	11 33	+ 1·60	+ 1·61	17 14 22	196 53 27	0		35·69	0 47 20	35·66	0 47 17	R. S.
„ 14	11 30	+ 1·65	+ 1·55	17 13 2	196 53 22	0		35·49	0 46 13			C. G. T.
„ 21	11 32	+ 1·49	+ 1·72	17 14 47	196 53 20	0		35·68	0 47 38			R. S.
„ 28	11 39	+ 1·64	+ 1·59	17 14 57	196 53 27	0		35·78	0 47 59			C. G. T.
Aug. 4	11 45	+ 1·62	+ 1·60	17 14 35	196 53 37	0		35·71	0 47 25	35·62	0 46 43	R. S.
„ 12	11 37	+ 1·60	+ 1·65	17 13 17	196 53 42	0		35·54	0 45 58			C. G. T.
„ 18	11 33	+ 1·37	+ 1·79	17 12 27	196 53 25	0		35·31	0 44 59			R. S.
„ „	15 27	+ 1·62	+ 1·59	17 15 7	196 53 35	0		35·83	0 47 59			R. S.
„ 25	11 33	+ 1·65	+ 1·60	17 14 22	196 53 37	0		35·69	0 47 14			C. G. T.
Sept. 1	11 34	+ 1·55	+ 1·50	17 16 12	196 53 45	0		35·93	0 48 56	35·70	0 47 23	R. S.
„ 8	11 34	+ 1·60	+ 1·47	17 13 55	196 53 47	0		35·62	0 46 42			C. G. T.
„ 15	11 48	+ 1·59	+ 1·67	17 14 0	196 53 45	0		35·59	0 46 35			R. S.
„ 22	11 33	+ 1·62	+ 1·67	17 14 52	196 53 52	0		35·70	0 47 23			C. G. T.
„ 29	10 41	+ 1·57	+ 1·70	17 14 45	196 53 45	0		35·67	0 47 18			R. S.
Oct. 6	11 42	+ 1·61	+ 1·55	17 15 10	196 53 57	0		35·77	0 47 43	36·02	0 49 15	C. G. T.
„ 13	11 42	+ 1·57	+ 1·65	17 15 25	196 53 42	0		35·86	0 48 3			R. S.
„ 20	11 33	+ 1·57	+ 1·65	17 19 37	196 56 0	15 w.	1·02	36·22	0 50 20			C. G. T.
„ 27	12 38	+ 1·60	+ 1·52	17 19 57	196 55 35	0		36·22	0 50 54			R. S.
Nov. 3	11 28	+ 1·57	+ 1·50	17 17 55	196 55 57	0		35·99	0 48 28	36·17	0 49 47	C. G. T.
„ 10	11 34	+ 1·57	+ 1·52	17 19 47	196 56 35	0		36·14	0 49 41			R. S.
„ 17	11 43	+ 1·60	+ 1·52	17 20 40	196 56 27	0		36·31	0 50 45			C. G. T.
„ 24	11 33	+ 1·57	+ 1·55	17 19 52	196 56 5	0		36·26	0 50 14			R. S.
Dec. 1	11 29	+ 1·60	+ 1·50	17 20 37	196 56 35	0		36·31	0 50 35	36·22	0 50 7	C. G. T.
„ 8	11 28	+ 1·60	+ 1·50	17 19 15	196 56 30	7 w.	1·40	36·09	0 49 33			R. S.
„ 15	11 35	+ 1·60	+ 1·56	17 20 25	196 56 45	0		36·21	0 50 9			C. G. T.
„ 22	11 36	+ 1·60	+ 1·50	17 21 7	196 57 40	10 w.	1·39	36·25	0 50 21			C. G. T.
„ 29	11 30	+ 1·55	+ 1·52	17 21 17	196 57 45	0		36·23	0 49 59			C. G. T.

The Mean Declination for the year 1870 = 0° 47′ 47″

Absolute Magnetical Observations.—Table XVIII.

OBSERVATIONS OF INCLINATION, 1867 TO 1870.

April to December 1867.

Taken with Barrow's Dip Circle, with Microscopes, No. 49 and two 3½ inch Needles.

1867.	Bombay Civil Time (0 to 24 hours).		Observer.	Needle marked.	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.	At Commencement.	At Conclusion.			A		B				
					Face of Circle		Face of Circle				
					East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
April 29	15 50	16 16	C. C.	2	18 57·7	19 9·2	18 57·9	19 5·5	19 2·6	19 1·1	19 1·1
„ 30	12 38	13 35	„	1	19 1·9	19 11·4	18 46·0	18 57·1	18 59·7		
May 3	12 37	15 0	C. G. T.	2	18 56·6	19 6·7	18 56·6	19 8·8	19 2·4	19 2·9	19 1·9
„ 7	11 15	14 2	„	1	19 1·6	19 12·8	18 49·8	18 53·0	18 59·3		
„ 9	11 38	14 3	R. S. M.	1	19 1·0	19 14·3	18 48·7	19 20·3	19 6·1		
„ 10-11	11 46	12 20	C. C.	1	18 58·6	19 8·9	18 49·6	19 22·0	19 4·8		
„ 10	12 25	16 31	C. G. T.	1	18 58·8	19 8·4	18 46·6	19 9·7	19 0·4	19 2·1	
„ 14	11 25	14 1	„	2	18 58·7	19 5·2	18 55·4	19 16·1	19 3·9		
„ 17	12 34	15 5	„	2	18 59·1	19 7·1	18 47·4	19 11·4	19 1·3	19 0·4	
„ 21	11 2	13 25	„	1	18 52·5	19 8·2	18 42·8	19 14·7	18 59·6		
„ 27	11 0	13 39	„	1	18 51 6	19 4·2	18 40·5	19 14·4	18 57·7	19 0·4	
„ 28	11 5	13 14	„	2	19 0·6	19 10·6	18 44·0	19 16·9	19 3·2		
„ 31	11 20	13 8	„	2	18 58·9	19 12·0	18 43·7	19 14·9	19 2·4	19 1·9	
June 4	11 10	13 58	C.G.T.& R.S.	1	18 52·5	19 16·8	18 40·8	19 16·4	19 1·5		19 1·5
„ 7	11 50	13 40	„	1	18 55·2	19 7·2	18 36·6	19 16·7	18 58·9	19 2·0	
„ 11	11 13	12 56	C. G. T.	2	19 0·7	19 9·7	18 48·0	19 22·1	19 5·1		
„ 14	15 14	17 8	„	2	19 2·6	19 9·3	18 49·2	19 14·4	19 1·9	19 0·4	
„ 18-19	11 14	12 7	„	1	18 57·9	19 5·7	18 46·9	19 5·3	18 58·9		
„ 21	15 21	17 22	„	1	19 3·0	19 6·6	18 39·8	19 3·4	18 58·2	19 1·4	
„ 25	11 10	13 15	R. S. M.	2	19 1·3	19 12·6	18 48·6	19 16·4	19 4·7		
„ 28	15 5	17 0	C. G. T.	2	19 5·4	19 11·6	18 43·4	19 12·6	19 3·2	18 59·8	
July 2	10 50	12 19	„	1	18 58·3	19 5·4	18 38·1	19 4·4	18 56·5		19 · 0·8
„ 5	15 30	16 56	„	1	19 0·5	19 3·9	18 41·1	19 4·1	18 57·4	18 59·8	
„ 9	10 48	12 23	„	2	19 4·8	19 8·5	18 49·9	19 5·7	19 2·2		
„ 12	15 55	17 36	R. S. M.	2	19 4·6	19 12·7	18 49·3	19 11·7	19 4·6	19 1·3	
„ 16	11 25	13 5	„	1	18 58·4	19 5·9	18 40·2	19 7·6	18 58·0		
„ 19	15 20	16 45	C. G. T.	1	18 59·2	19 7·8	18 44·6	19 6·5	18 59·5	19 1·5	
„ 23	10 35	12 30	R. S. M.	2	19 5·6	19 14·2	18 51·4	19 3·1	19 3·6		
„ 26	15 15	16 40	C. G. T.	2	19 6·3	19 15·6	18 56·3	19 2·6	19 5·2	19 2·7	
„ 30	10 10	11 30	R. S. M.	1	18 58·6	19 8·4	18 48·7	19 5·6	19 0·3		
Aug. 2	15 15	16 30	C. G. T.	1	18 59·5	19 8·6	18 47·6	19 5·6	19 0·3	19 2·8	19 2·2
„ 6	10 0	11 50	R. S. M.	2	19 6·0	19 16·2	18 55·8	19 3·5	19 5·4		
„ 9	15 30	16 34	C. G. T.	2	19 5·8	19 17·2	18 56·7	19 5·2	19 6·2	19 1·7	
„ 13	10 15	12 15	R. S. M.	1	18 58·1	19 6·9	18 39·6	19 4·5	18 57·3		
„ 16	15 28	16 54	C. G. T.	1	18 57·7	19 9·8	18 50·1	19 6·6	19 1·0		
„ 20	9 36	11 10	„	2	19 5·3	19 13·8	18 49·6	19 5·1	19 3·4	19 2·4	
„ 23	15 30	17 6	R. S. M.	2	19 5·2	19 14·6	18 51·9	19 4·4	19 4·0		
„ 27	10 0	11 55	„	1	18 58·3	19 8·8	18 49·9	19 6·5	19 0·9		
„ 30	15 17	16 34	C. G. T.	1	18 58·2	19 10·7	18 50·1	19 7·0	19 1·5	19 2·3	
Sept. 3	10 8	11 45	„	2	19 3·3	19 11·9	18 51·0	19 6·3	19 3·1		19 2·5
„ 6	15 15	16 25	R. S. M.	2	19 5·7	19 13·3	18 52·6	19 5·4	19 4·2	19 2·9	
„ 10	10 15	11 32	„	1	18 59·4	19 10·6	18 49·5	19 6·8	19 1·6		
„ 13	15 14	16 28	C. G. T.	1	19 0·0	19 9·1	18 51·2	19 8·0	19 2·1	19 2·3	
„ 17	10 11	11 38	„	2	19 2·8	19 11·8	18 52·2	19 3·7	19 2·6		
„ 20	15 25	16 33	R. S. M.	2	19 3·2	19 10·7	18 50·9	19 4·3	19 2·3	19 2·0	
„ 24	10 0	11 5	„	1	18 59·8	19 10·4	18 50·5	19 6·4	19 1·8		
„ 27	15 23	16 23	C. G. T.	1	19 0·1	19 10·2	18 51·5	19 8·4	19 2·5	19 2·5	

[*Continued.*

1867.		Bombay Civil Time (0 to 24 hours).				Observer.	Needle Marked.	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.		At Commencement.		At Conclusion.				A		B				
								Face of Circle		Face of Circle				
								East.	West.	East.	West.			
		h.	m.	h.	m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
Oct.	1	10	14	11	18	C. G. T.	2	19 1·6	19 11·1	18 52·4	19 4·9	19 2·5	19 2·3	19 2·5
„	4	15	20	16	20	R. S. M.	2	19 2·5	19 10·4	18 51·9	19 4·6	19 2·3		
„	8	10	15	11	16	„	1	19 0·1	19 10·1	18 50·4	19 9·0	19 2·4		
„	11	15	24	16	24	C. G. T.	1	18 59·2	19 11·8	18 51·4	19 9·9	19 3·1	19 2·8	
„	15	10	10	11	21	„	2	19 0·9	19 11·9	18 52·4	19 5·3	19 2·6		
„	18	15	25	16	20	R. S. M.	2	19 1·4	19 11·8	18 51·7	19 3·8	19 2·2	19 2·2	
„	22	9	50	10	50	„	1	19 0·0	19 10·2	18 51·1	19 8·1	19 2·3		
„	25	15	20	16	25	C. G. T.	1	19 0·9	19 10·3	18 51·0	19 8·9	19 2·8	19 2·6	
„	29	10	15	11	20	„	2	19 0·5	19 12·1	18 52·2	19 5·2	19 2·5		
Nov.	1	15	20	16	20	R. S. M.	2	19 1·4	19 11·6	18 52·6	19 5·2	19 2·7	19 2·7	19 2·8
„	5	9	53	11	6	„	1	19 2·4	19 9·7	18 51·4	19 7·7	19 2·8		
„	8	15	25	16	27	C. G. T.	1	19 2·2	19 10·4	18 50·7	19 8·1	19 2·8	19 2·7	
„	12	10	20	11	25	„	2	19 1·5	19 11·1	18 52·7	19 5·2	19 2·6		
„	15	15	37	16	30	R. S. M.	2	19 1·6	19 11·0	18 53·0	19 5·4	19 2·7	19 2·8	
„	19	9	59	11	6	„	1	19 2·7	19 11·4	18 50·6	19 7·3	19 3·0		
„	22	15	24	16	31	C. G. T.	1	19 2·6	19 11·7	18 50·5	19 7·2	19 3·0	19 2·8	
„	26	10	0	10	57	„	2	19 2·4	19 10·6	18 53·1	19 4·6	19 2·7		
„	29	15	27	16	24	R. S. M.	2	19 2·7	19 10·7	18 53·5	19 4·0	19 2·7	19 2·8	
Dec.	3	10	17	11	15	„	1	19 2·3	19 11·3	18 50·7	19 7·7	19 3·0		19 2·7
„	6	15	15	16	17	C. G. T.	1	19 2·6	19 12·1	18 51·4	19 7·5	19 3·4	19 3·1	
„	10	10	11	11	21	„	2	19 1·3	19 11·6	18 54·4	19 4·1	19 2·8		
„	13	15	26	16	19	R. S. M.	2	19 1·4	19 11·2	18 53·2	19 4·3	19 2·5	19 2·7	
„	17	9	52	10	56	„	1	19 2·5	19 12·2	18 50·1	19 7·2	19 3·0		
„	21	13	15	15	32	„	1	19 3·1	19 9·5	18 54·3	19 0·3	19 1·8	19 2·5	
„	24	10	45	11	55	C. G. T.	2	19 2·0	19 12·5	18 52·6	19 5·6	19 3·2		
„	28	15	52	16	45	R. S. M.	2	19 1·3	19 12·5	18 53·0	19 5·4	19 3·1	19 2·5	
„	31	10	25	11	45	„	1	19 2·8	19 9·4	18 55·2	19 0·3	19 1·9		

The Mean Dip for the months April to December 1867 = 19 2·0

Absolute Magnetical Observations, Table XIX.

OBSERVATIONS OF INCLINATION, 1868.

Taken with Barrow's Dip Circle, with Microscopes, No. 49 and two 3½-inch Needles.

1868.	Bombay Civil Time (0 to 24 hours).		Observer.	Needle marked.	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.					A Face of Circle		B Face of Circle				
	At Commencement.	At Conclusion.			East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 3	15 30	16 39	R. S.	1	19 3·0	19 9·6	18 54·8	19 0·1	19 1·9	19 2·5	19 2·7
„ 7	10 30	11 46	C. G. T.	2	19 0·7	19 14·2	18 52·4	19 5·5	19 3·2		
„ 10	15 21	16 34	„	2	19 1·1	19 15·7	18 52·2	19 5·3	19 3·6	19 2·7	
„ 14	10 40	11 38	„	1	19 2·2	19 9·1	18 55·9	19 0·3	19 1·9		
„ 17	15 30	16 40	R. S.	1	19 2·9	19 9·5	18 55·4	19 0·6	19 2·1	19 2·8	
„ 21	10 15	11 10	„	2	19 1·3	19 14·7	18 52·1	19 6·1	19 3·5		
„ 24	15 20	16 28	C. G. T.	2	19 1·2	19 13·4	18 53·0	19 6·9	19 3·6	19 2·7	
„ 28	10 36	11 34	„	1	19 2·6	19 9·7	18 55·5	18 59·9	19 1·9		
„ 31	15 40	17 4	R. S.	1	19 4·2	19 10·3	18 55·8	18 59·4	19 2·4	19 3·2	
Feb. 1	10 35	11 34	„	2	19 1·8	19 12·9	18 55·0	19 6·7	19 4·1		19 3·4
„ 7	15 40	16 46	C. G. T.	2	19 2·5	19 13·0	18 54·1	19 7·1	19 4·2	19 3·5	
„ 11	10 20	11 24	„	1	19 4·8	19 10·9	18 55·2	19 0·2	19 2·8		
„ 14	15 38	16 49	R. S.	1	19 4·2	19 11·2	18 55·6	18 59·6	19 2·6	19 3·4	
„ 18	10 20	11 20	„	2	19 2·0	19 13·2	18 55·2	19 6·6	19 4·2		
„ 20	15 59	16 56	C. G. T.	2	19 1·9	19 13·6	18 54·9	19 7·3	19 4·4	19 3·4	
„ 25	10 25	11 38	„	1	19 4·6	19 10·0	18 55·4	19 0·1	19 2·5		
„ 28	15 44	16 38	R. S.	1	19 5·5	19 10·7	18 55·4	18 59·6	19 2·8	19 3·5	
March 3	10 25	11 18	„	2	19 2·7	19 12·9	18 55·4	19 5·9	19 4·2		19 3·8
„ 7	8 56	9 50	C. G. T.	2	19 1·6	19 13·0	18 56·0	19 6·1	19 4·2	19 3·4	
„ 10	10 28	11 23	„	1	19 4·7	19 10·7	18 55·7	18 59·9	19 2·7		
„ 13	15 26	16 32	R. S.	1	19 4·6	19 11·2	18 55·7	18 59·8	19 2·8	19 3·5	
„ 17	10 30	11 45	„	2	19 2·1	19 13·0	18 55·8	19 5·9	19 4·2		
„ 20	15 16	16 31	C. G. T.	2	19 2·4	19 13·5	18 56·4	19 6·1	19 4·6	19 4·1	
„ 24	10 48	11 54	„	1	19 4·7	19 11·4	18 58·2	19 0·6	19 3·7		
„ 27	15 22	16 23	R. S.	1	19 4·9	19 11·4	18 58·7	19 0·6	19 3·9	19 4·1	
„ 31	10 15	11 16	„	2	19 2·2	19 12·9	18 56·2	19 6·1	19 4·3		
April 3	15 30	16 20	„	2	19 2·5	19 13·1	18 56·1	19 6·2	19 4·5	19 4·2	19 4·1
„ 7	10 20	11 40	„	1	19 4·9	19 11·2	18 58·7	19 0·7	19 3·9		
„ 11	15 30	16 30	„	1	19 5·6	19 11·1	18 58·5	19 1·1	19 4·1	19 4·2	
„ 14	10 15	11 20	„	2	19 2·2	19 13·1	18 56·0	19 5·8	19 4·3		
„ 17	15 29	16 20	„	2	19 2·0	19 13·2	18 55·8	19 5·9	19 4·2	19 3·8	
„ 21	10 15	11 18	„	1	19 5·1	19 11·5	18 57·1	19 0·1	19 3·4		
„ 24	15 31	16 29	„	1	19 5·6	19 11·6	18 57·3	19 0·2	19 3·7	19 4·1	
„ 28	10 10	11 0	„	2	19 2·0	19 12·9	18 57·0	19 6·2	19 4·5		
May 1	15 30	16 25	„	2	19 2·6	19 12·7	18 56·8	19 6·9	19 4·7	19 4·0	19 4·1
„ 5	10 14	11 3	„	1	19 5·7	19 11·6	18 56·6	18 59·8	19 3·4		
„ 8	15 27	16 19	„	1	19 5·4	19 12·0	18 56·7	18 59·6	19 3·4	19 3·9	
„ 12	9 50	10 51	„	2	19 2·2	19 12·6	18 56·9	19 6·3	19 4·5		
„ 15	15 15	16 10	„	2	19 2·4	19 12·5	18 57·2	19 6·4	19 4·6	19 4·1	
„ 19	10 15	11 12	„	1	19 6·0	19 11·3	18 57·0	19 0·3	19 3·6		
„ 22	15 25	16 20	„	1	19 5·6	19 11·5	18 56·7	19 0·2	19 3·5	19 4·0	
„ 26	10 20	11 32	„	2	19 2·7	19 12·6	18 56·9	19 6·3	19 4·6		
„ 29	15 25	16 25	„	2	19 2·7	19 13·0	18 56·8	19 6·2	19 4·7	19 4·2	
June 2	10 30	11 37	„	1	19 5·8	19 10·6	18 57·9	19 1·0	19 3·8		19 4·3
„ 5	15 20	16 20	„	1	19 5·7	19 10·9	18 57·8	19 1·1	19 3·9	19 4·3	
„ 9	10 20	11 30	„	2	19 2·7	19 12·7	18 57·2	19 6·4	19 4·7		
„ 12	15 20	16 15	„	2	19 2·5	19 12·7	18 57·6	19 6·7	19 4·9	19 4·3	
„ 16	10 15	11 15	„	1	19 5·9	19 10·8	18 57·4	19 1·2	19 3·8		
„ 19	15 20	16 15	„	1	19 5·9	19 10·6	18 57·8	19 1·3	19 3·9	19 4·3	
„ 23	10 30	11 21	C. G. T.	2	19 3·0	19 12·4	18 57·4	19 6·1	19 4·7		
„ 26	15 26	16 21	„	2	19 2·2	19 13·6	18 58·2	19 6·7	19 5·2	19 4·5	
„ 30	10 22	11 21	„	1	19 6·7	19 10·5	18 57·8	19 0·7	19 3·9		

[*Continued.*

1868.	Bombay Civil Time (0 to 24 hours).		Observer.	Needle marked.	End of Needle dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.	At Commencement.	At Conclusion.			A		B				
					Face of Circle		Face of Circle				
					East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
July 3	15 20	16 25	R. S.	1	19 5·2	19 10·6	18 57·5	19 1·1	19 3·8	19 4·3	19 4·3
,, 7	10 15	11 20	,,	2	19 2·9	19 13·0	18 57·5	19 6·0	19 4·8		
,, 10	15 19	16 21	C. G. T.	2	19 2·5	19 13·4	18 57·7	19 7·3	19 5·2	19 4·5	
,, 14	10 28	11 20	,,	1	19 6·6	19 10·6	18 58·0	18 59·9	19 3·8		
,, 17	15 30	16 22	R. S.	1	19 6·4	19 10·9	18 57·7	18 59·9	19 3·7	19 4·3	
,, 21	10 28	11 23	,,	2	19 3·1	19 12·9	18 57·8	19 6·3	19 5·0		
,, 24	15 22	16 18	C. G. T.	2	19 2·4	19 13·2	18 58·1	19 6·1	19 4·9	19 4·3	
,, 28	10 10	11 8	,,	1	19 6·7	19 10·4	18 57·6	19 0·3	19 3·7		
,, 31	15 30	16 27	R. S.	1	19 6·7	19 10·3	18 57·7	19 0·2	19 3·7	19 4·3	
Aug. 4	10 15	11 30	,,	2	19 2·9	19 13·2	18 57·5	19 6·2	19 4·9		19 4·2
,, 7	15 18	16 16	C. G. T.	2	19 2·8	19 13·1	18 57·7	19 6·4	19 5·0	19 4·4	
,, 11	10 16	11 8	,,	1	19 6·4	19 10·6	18 57·2	19 1·1	19 3·8		
,, 14	15 18	16 13	,,	1	19 6·7	19 10·4	18 57·1	19 0·7	19 3·7	19 4·1	
,, 18	10 32	11 20	,,	2	19 1·5	19 13·6	18 57·7	19 5·3	19 4·5		
,, 21	15 16	16 5	,,	2	19 1·5	19 12·3	18 57·9	19 5·6	19 4·3	19 4·0	
,, 25	10 20	11 4	,,	1	19 6·8	19 10·6	18 56·9	19 0·8	19 3·8		
,, 28	15 14	16 10	,,	1	19 6·4	19 10·1	18 57·5	19 1·2	19 3·8	19 4·4	
Sept. 1	10 15	11 14	R. S.	2	19 2·7	19 13·6	18 58·2	19 5·9	19 5·1		19 4·3
,, 4	15 24	16 18	C. G. T.	2	19 2·7	19 12·9	18 58·2	19 6·2	19 5·0	19 4·2	
,, 8	10 16	11 15	,,	1	19 6·6	19 10·0	18 56·4	19 0·5	19 3·4		
,, 11	15 30	16 24	R. S.	1	19 6·4	19 10·2	18 57·4	18 59·9	19 3·5	19 4·2	
,, 15	10 15	11 40	,,	2	19 2·6	19 13·2	18 58·2	19 6·1	19 5·0		
,, 18	15 25	16 18	C. G. T.	2	19 2·7	19 13·1	18 58·0	19 5·8	19 4·9	19 4·1	
,, 22	10 20	11 15	,,	1	19 5·7	19 10·2	18 56·6	19 0·9	19 3·3		
,, 25	15 10	16 20	R. S.	1	19 6·3	19 10·7	18 56·3	19 0·6	19 3·5	19 4·2	
,, 29	10 15	11 15	,,	2	19 2·6	19 13·3	18 58·4	19 5·7	19 5·0		
Oct. 2	15 33	16 30	,,	2	19 2·6	19 13·1	18 58·4	19 5·9	19 5·0	19 4·2	19 4·2
,, 6	10 40	11 48	,,	1	19 7·2	19 9·9	18 56·1	19 0·6	19 3·4		
,, 9	15 15	16 13	,,	1	19 7·7	19 10·2	18 55·3	19 0·1	19 3·3	19 4·2	
,, 13	10 10	11 15	,,	2	19 3·1	19 13·5	18 58·2	19 5·9	19 5·2		
,, 16	16 13	17 9	,,	2	19 2·6	19 14·0	18 56·0	19 6·4	19 4·7	19 4·4	
,, 20	10 42	11 42	C. G. T.	1	19 7·7	19 10·9	18 56·2	19 1·6	19 4·1		
,, 23	15 29	16 30	R. S.	1	19 14·1	19 10·9	18 52·6	18 57·6	19 3·8	19 4·0	
,, 27	10 20	11 32	,,	2	19 2·6	19 13·7	18 55·3	19 5·5	19 4·3		
,, 30	15 15	16 30	,,	2	19 2·0	19 12·7	18 55·5	19 7·3	19 4·4	19 3·8	
Nov. 3	10 40	12 0	,,	1	19 11·9	19 12·1	18 52·6	18 56·6	19 3·3		19 3·6
,, 6	15 14	16 22	C. G. T.	1	19 10·4	19 14·1	18 49·6	18 57·1	19 2·8	19 3·4	
,, 10	10 21	11 30	,,	2	19 0·9	19 10·7	18 55·9	19 9·0	19 4·1		
,, 13	15 15	16 12	,,	2	19 1·4	19 10·5	18 56·5	19 8·7	19 4·3	19 3·5	
,, 17	10 20	11 21	,,	1	19 11·5	19 14·6	18 47·6	18 57·2	19 2·7		
,, 20	15 14	16 15	,,	1	19 10·2	19 17·7	18 45·6	18 58·2	19 2·9	19 3·4	
,, 24	10 20	11 19	,,	2	19 1·7	19 10·1	18 55·3	19 8·9	19 4·0		
,, 27	15 10	16 11	,,	2	19 0·6	19 11·4	18 54·9	19 10·7	19 4·4	19 3·6	
Dec. 1	10 25	11 25	,,	1	19 9·1	19 20·4	18 45·1	18 56·6	19 2·8		19 3·5
,, 4	15 16	16 20	R. S.	1	19 8·7	19 20·2	18 43·0	18 58·1	19 2·5	19 3·5	
,, 8	10 10	11 25	,,	2	19 0·9	19 10·6	18 55·9	19 10·7	19 4·5		
,, 11	15 15	16 20	,,	2	19 0·7	19 10·7	18 56·1	19 10·0	19 4·4	19 3·4	
,, 15	10 15	11 18	,,	1	19 9·6	19 20·2	18 43·6	18 56·8	19 2·5		
,, 18	15 15	16 17	C. G. T.	1	19 10·4	19 21·1	18 43·6	18 58·3	19 3·3	19 3·8	
,, 22	10 50	11 50	,,	2	19 1·3	19 11·5	18 55·0	19 9·8	19 4·4		
,, 24	15 16	16 15	,,	2	19 1·5	19 11·9	18 54·8	19 9·9	19 4·5	19 3·7	
,, 29	10 21	11 20	,,	1	19 9·4	19 22·6	18 42·6	18 57·1	19 2·9		

The Mean Dip for the year 1868 = 19 3·9

Absolute Magnetical Observations, Table XX.

OBSERVATIONS OF INCLINATION, 1869.

Taken with Barrow's Dip Circle, with Microscopes, No. 49 and two 3½-inch Needles.

1869.	Bombay Civil Time (0 to 24 hours).		Observer.	Needle marked.	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
					A		B				
					Face of Circle		Face of Circle				
Date.	At Commencement.	At Conclusion.			East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 2	15 28	16 28	R. S. M.	1	19 10·9	19 21·5	18 42·4	18 57·7	19 3·1	19 3·8	19 3·7
„ 5	10 12	11 20	„	2	19 2·0	19 11·6	18 54·7	19 9·7	19 4·5		
„ 8	15 15	16 16	C. G. T.	2	19 3·2	19 12·2	18 55·9	19 8·5	19 4·9	19 3·7	
„ 12	11 10	12 12	„	1	19 10·1	19 21·9	18 41·9	18 56·3	19 2·5		
„ 15	15 23	16 24	R. S. M.	1	19 9·1	19 22·6	18 41·6	18 56·4	19 2·4	19 3·5	
„ 19	11 10	12 10	„	2	19 1·3	19 12·5	18 55·4	19 9·1	19 4·6		
„ 22	15 9	16 9	„	1	19 10·9	19 22·4	18 42·7	18 56·8	19 3·2		
„ 26	11 15	12 16	C. G. T.	1	19 12·1	19 22·5	18 39·6	18 58·6	19 3·2	19 4·2	
„ 29	15 10	16 12	„	2	19 2·3	19 14·0	18 56·4	19 8·4	19 5·3		
Feb. 2	11 9	12 4	R. S. M.	2	19 1·9	19 14·3	18 54·8	19 8·3	19 4·8	19 4·0	19 4·8
„ 5	15 32	16 23	„	1	19 11·2	19 24·9	18 38·1	18 58·7	19 3·2		
„ 8	11 10	12 11	C. G. T.	1	19 11·6	19 27·2	18 37·6	19 1·7	19 4·5	19 4·9	
„ 12	15 10	16 9	„	2	19 2·4	19 14·9	18 55·7	19 8·1	19 5·3		
„ 16	11 10	12 24	R. S. M.	2	19 2·2	19 13·6	18 57·1	19 7·9	19 5·2	19 4·9	
„ 19	15 25	16 30	„	1	19 11·3	19 26·2	18 41·2	18 59·9	19 4·6		
„ 23	11 11	12 13	C. G. T.	1	19 12·8	19 27·3	18 39·3	19 0·0	19 4·8	19 5·2	
„ 26	15 12	16 13	„	2	19 3·7	19 13·5	18 57·1	19 8·4	19 5·7		
March 2	11 6	12 15	R. S. M.	2	19 3·1	19 13·2	18 55·9	19 8·4	19 5·1	19 5·0	19 5·2
„ 5	15 10	16 20	„	1	19 12·1	19 27·3	18 39·9	19 0·3	19 4·9		
„ 9	11 35	12 34	C. G. T.	1	19 11·4	19 27·6	18 39·2	18 59·9	19 4·5	19 5·1	
„ 12	14 40	17 20	„	2	19 3·4	19 14·1	18 57·2	19 7·5	19 5·5		
„ 12	15 24	16 31	„	2	19 2·7	19 14·4	18 56·9	19 7·4	19 5·3		
„ 16	10 25	13 30	R. S. M.	1	19 12·7	19 25·9	18 40·1	19 0·6	19 4·8	19 4·8	
„ 16	11 20	12 20	„	1	19 11·7	19 27·4	18 39·9	19 0·4	19 4·8		
„ 18	12 48	16 32	„	1	19 50·4	20 16·4	18 11·4	18 51·1	19 17·3		
„ 18	13 23	14 47	„	1	19 22·0	19 38·4	18 49·3	19 9·4	19 14·7		
„ 19	15 35	16 36	„	1	19 13·6	19 26·6	18 38·9	19 0·1	19 4·8		
„ 23	11 10	13 40	C. G. T.	2	18 48·5	18 31·7	18 14·7	19 24·7	18 44·9	19 5·2	
„ 23	11 50	13 4	„	2	19 3·0	19 12·9	18 55·1	19 9·7	19 5·2		
„ 27	15 15	16 26	„	2	19 2·3	19 14·4	18 54·2	19 10·1	19 5·2		
„ 30	12 7	13 11	R. S. M.	2	18 59·7	19 14·2	18 57·4	19 10·4	19 5·4	19 5·4	
April 2	15 28	16 25	„	2	19 0·3	19 14·2	18 57·2	19 10·4	19 5·5		19 6·0
„ 6	11 28	13 2	C. G. T.	2	19 0·7	19 13·6	18 57·9	19 10·7	19 5·7	19 5·7	
„ 9	15 15	16 40	„	2	19 0·4	19 13·2	18 58·6	19 11·2	19 5·8		
„ 13	11 37	12 39	R. S. M.	2	19 0·1	19 14·1	18 56·1	19 10·6	19 5·2	19 5·6	
„ 16	15 20	16 33	„	2	19 2·7	19 13·9	18 59·7	19 7·9	19 6·0		
„ 20	11 35	12 56	C. G. T.	2	19 2·4	19 13·6	19 0·2	19 9·6	19 6·4	19 6·6	
„ 23	15 10	16 28	„	2	19 4·7	19 11·2	19 1·2	19 10·4	19 6·8		
„ 27	11 12	12 50	R. S. M.	2	19 4·0	19 11·0	18 58·3	19 10·4	19 5·9	19 6·2	
„ 30	15 10	16 22	„	2	19 4·4	19 11·0	19 0·5	19 10·1	19 6·5		
May 4	11 15	12 38	C. G. T.	2	19 4·8	19 11·1	19 1·4	19 9·3	19 6·6	19 6·7	19 6·2
„ 7	15 10	16 29	„	2	19 5·5	19 10·2	19 2·9	19 8·9	19 6·8		
„ 11	11 22	12 22	R. S. M.	2	19 5·6	19 10·7	19 1·7	19 9·1	19 6·7	19 6·3	
„ 14	15 15	16 18	„	2	19 4·9	19 10·6	18 58·6	19 10·3	19 6·0		
„ 18	11 28	12 47	C. G. T.	2	19 4·4	19 11·2	18 59·2	19 9·9	19 6·1	19 6·1	
„ 21	15 10	16 21	„	2	19 4·1	19 10·5	19 0·1	19 9·7	19 6·1		
„ 25	11 25	12 58	R. S. M.	2	19 3·7	19 9·1	18 59·9	19 9·9	19 5·6	19 5·5	
„ 28	15 15	16 36	„	2	19 3·7	19 9·3	18 59·4	19 9·6	19 5·5		
June 1	11 20	12 43	C. G. T.	2	19 4·2	19 9·2	19 0·5	19 9·9	19 5·9	19 6·0	19 6·3
„ 4	15 12	16 36	„	2	19 4·1	19 9·7	19 0·7	19 10·6	19 6·2		
„ 8	11 15	12 52	R. S. M.	2	19 3·7	19 10·7	19 0·9	19 9·8	19 6·2	19 6·3	
„ 11	15 20	16 32	„	2	19 4·4	19 10·3	19 1·1	19 10·1	19 6·4		
„ 15	11 14	12 46	C. G. T.	2	19 3·6	19 9·5	19 2·1	19 9·8	19 6·2	19 6·3	
„ 18	15 16	16 37	„	2	19 4·2	19 9·5	19 1·9	19 10·3	19 6·4		
„ 22	11 17	12 48	R. S. M.	2	19 3·2	19 11·1	19 1·9	19 10·6	19 6·6	19 6·4	
„ 25	15 15	16 40	C. G. T.	2	19 3·4	19 9·9	19 0·9	19 10·9	19 6·2		
„ 29	11 12	12 39	„	2	19 2·1	19 10·4	19 1·7	19 13·4	19 6·8		

[Continued.

1869.		Bombay Civil Time (0 to 24 hours).				Observer.	Needle marked.	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.		At Commencement.		At Conclusion.				A		B				
								Face of Circle		Face of Circle				
								East.	West.	East.	West.			
		h.	m.	h.	m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
JULY	2	15	14	16	34	C. G. T.	2	19 3·2	19 11·2	19 2·1	19 13·6	19 7·5	19 7·1	19 6·8
"	6	11	12	13	0	R. S. M.	2	19 2·7	19 9·7	19 3·1	19 13·3	19 7·2	19 7·0	
"	9	15	10	16	27	"	2	19 1·1	19 10·1	19 2·7	19 13·4	19 6·8		
"	13	11	30	12	55	"	2	19 2·0	19 8·0	19 2·4	19 13·7	19 6·5	19 6·6	
"	16	15	53	17	15	"	2	19 2·4	19 8·9	19 2·4	19 13·4	19 6·7		
"	20	11	15	12	42	"	2	19 1·9	19 8·7	19 3·2	19 13·4	19 6·8	19 6·8	
"	23	15	10	16	28	"	2	19 1·6	19 10·1	19 2·7	19 12·9	19 6·8		
"	27	11	20	12	46	C. G. T.	2	19 2·6	19 8·7	19 0·9	19 14·4	19 6·6	19 6·6	
"	30	15	12	16	39	"	2	19 2·0	19 9·9	19 0·9	19 14·4	19 6·7		
AUG.	3	13	10	14	36	R. S. M.	2	19 0·4	19 9·0	19 1·7	19 13·6	19 6·1	19 6·3	19 6·4
"	6	15	0	16	29	"	2	19 1·5	19 10·5	19 1·0	19 13·5	19 6·6		
"	10	11	13	12	36	C. G. T.	2	19 0·7	19 10·5	18 59·8	19 15·7	19 6·6	19 6·5	
"	13	15	10	16	40	"	2	19 1·7	19 10·4	18 58·2	19 15·4	19 6·4		
"	17	11	10	12	48	R. S. M.	2	19 0·2	19 9·8	19 1·1	19 15·[illegible]	19 6·5	19 6·4	
"	20	15	10	16	30	"	2	19 1·4	19 9·8	19 0·3	19 14·0	19 6·3		
"	24	11	16	12	46	C. G. T.	2	19 0·7	19 8·9	18 59·8	19 16·7	19 6·5	19 6·5	
"	27	15	15	16	30	"	2	19 0·1	19 9·9	19 0·7	19 15·3	19 6·5		
"	31	11	23	12	57	R. S. M.	2	19 1·7	19 8·2	19 0·7	19 15·4	19 6·4	19 6·3	
SEPT.	3	15	10	16	29	"	2	19 0·7	19 7·8	19 1·2	19 15·4	19 6·2		19 5·7
"	7	11	20	12	46	C. G. T.	2	19 0·6	19 8·2	18 58·2	19 15·8	19 5·7	19 5·5	
"	10	15	12	16	35	"	2	19 0·1	19 7·1	18 57·7	19 16·4	19 5·3		
"	14	11	20	12	43	R. S. M.	2	18 58·8	19 7·4	18 59·1	19 15·9	19 5·3	19 5·4	
"	17	15	13	16	33	"	2	19 59·1	19 7·4	18 59·6	19 16·0	19 5·5		
"	21	11	15	12	46	C. G. T.	2	19 0·4	19 6·9	18 58·2	19 17·2	19 5·6	19 5·6	
"	24	15	12	16	32	"	2	18 59·9	19 6·9	18 57·4	19 18·8	19 5·7		
"	28	11	12	12	45	R. S. M.	2	19 1·8	19 9·2	18 57·2	19 16·8	19 6·2	19 5·9	
OCT.	1	15	15	16	29	"	2	18 59·9	19 7·2	18 57·7	19 18·4	19 5·7		19 6·2
"	5	11	15	12	48	C. G. T.	2	18 59·8	19 7·2	18 58·2	19 18·9	19 6·0	19 6·1	
"	8	15	14	16	27	"	2	18 58·2	19 9·7	18 58·7	19 18·8	19 6·3		
"	12	11	15	12	33	R. S. M.	2	18 57·1	19 9·4	18 58·2	19 18·9	19 5·8	19 6·0	
"	15	15	10	16	30	"	2	18 56·1	19 11·2	18 59·2	19 18·6	19 6·2		
"	19	11	12	12	41	C. G. T.	2	18 56·8	19 8·6	18 59·1	19 20·1	19 6·1	19 6·2	
"	22	15	10	16	35	"	2	18 57·6	19 8·4	19 0·6	19 18·9	19 6·3		
"	26	11	11	12	48	R. S. M.	2	18 59·4	19 10·6	18 59·9	19 17·6	19 6·8	19 6·7	
"	29	15	10	16	35	"	2	18 59·2	19 8·9	19 1·3	19 17·6	19 6·7		
NOV.	2	10	45	12	27	P. L. D.	2	18 58·6	19 9·7	19 2·9	19 19·9	19 7·7	19 7·1	19 6·5
"	5	15	15	16	38	"	2	18 59·1	19 9·0	19 0·4	19 17·9	19 6·5		
"	9	11	10	12	43	R. S. M.	2	18 57·1	19 8·9	19 0·1	19 18·6	19 6·1	19 6·4	
"	12	15	20	16	39	"	2	18 57·6	19 9·4	19 1·8	19 18·1	19 6·7		
"	16	11	25	13	1	P. L. D.	2	18 57·1	19 8·9	18 59·5	19 19·3	19 6·2	19 6·4	
"	19	15	5	16	36	"	2	18 59·6	19 9·4	18 59·4	19 18·2	19 6·6		
"	23	11	10	12	55	R. S. M.	2	18 58·2	19 8·9	18 59·3	19 18·0	19 6·0	19 6·1	
"	26	15	20	16	35	"	2	18 58·2	19 9·4	18 59·2	19 18·2	19 6·2		
"	30	11	20	12	43	C. G. T.	2	18 57·3	19 10·4	18 59·0	19 18·9	19 6·3	19 6·4	
DEC.	3	15	17	16	36	"	2	18 56·7	19 11·0	19 0·9	19 17·7	19 6·5		19 5·6
"	7	11	18	12	42	R. S. M.	2	18 55·8	19 10·7	19 0·6	19 18·1	19 6·2	19 6·2	
"	10	15	7	16	37	"	2	18 56·6	19 10·4	19 0·9	19 17·6	19 6·3		
"	14	11	15	12	42	C. G. T.	2	18 55·2	19 9·6	19 1·1	19 18·1	19 6·0	19 6·2	
"	17	15	10	16	33	"	2	18 55·1	19 9·7	19 1·8	19 19·0	19 6·4		
"	21	11	12	12	45	R. S. M.	2	18 53·2	19 11·2	19 0·7	19 18·7	19 6·0	19 5·2	
"	24	15	15	16	43	"	2	18 50·4	19 9·6	18 59·9	19 17·7	19 4·4		
"	28	11	10	12	49	C. G. T.	2	18 52·1	19 6·9	18 57·4	19 20·4	19 4·2	19 4·1	
"	31	15	14	16	32	"	2	18 53·5	19 5·9	18 57·4	19 19·9	19 4·1		

The Mean Dip for the year 1869 = 19 5·8

Absolute Magnetical Observations.—Table XXI.

OBSERVATIONS OF INCLINATION, 1870.

Taken with Barrow's Dip Circle, with Microscopes, No. 49 and two 3½ inch Needles— No. 2 by Barrow and No. 13 by Adie.

1870.	Bombay Civil Time (0 to 24 hours).		Observer.	Needle marked	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
Date.	At Commencement.	At Conclusion.			A		B				
					Face of Circle		Face of Circle				
					East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 4	11 26	12 48	R.	2	18 53·6	19 8·8	19 5·7	19 18·2	19 6·5	19 6·2	19 5·6
„ 5	13 15	14 45	C.	2	18 51·1	19 11·6	19 0·9	19 23·6	19 6·7		
„ 7	15 55	17 6	R.	2	18 52·3	19 8·4	19 1·8	19 19·9	19 5·5		
„ 11	11 40	13 3	C.	2	18 47·6	19 7·9	18 59·1	19 23·8	19 4·5	19 4·8	
„ 14	15 13	16 34	C.	2	18 46·1	19 10·1	18 59·6	19 24·7	19 5·1		
„ 18	11 14	12 36	R.	2	18 47·6	19 9·2	19 0·7	19 23·9	19 5·3	19 5·2	
„ 21	15 10	16 24	R.	2	18 45·7	19 10·9	19 0·4	19 24·1	19 5·2		
„ 25	11 12	12 40	C.	2	18 45·9	19 12·1	18 57·6	19 26·6	19 5·5	19 5·7	
„ 28	15 12	16 34	C.	2	18 47·2	19 11·2	18 59·4	19 26·2	19 6·0		
Feb. 1	11 15	13 10	R.	2	18 46·9	19 11·5	18 58·5	19 26·2	19 5·7	19 5·7	19 5·8
„ 4	15 15	16 17	R.	2	18 47·5	19 11·3	18 58·1	19 26·4	19 5·8		
„ 8	11 11	12 39	C.	2	18 45·3	19 12·2	18 58·7	19 27·7	19 5·9	19 5·9	
„ 11	15 15	16 33	C.	2	18 46·4	19 11·7	18 59·8	19 25·8	19 5·9		
„ 15	11 13	12 43	R.	2	18 46·7	19 10·9	18 58·6	19 26·9	19 5·7	19 5·6	
„ 18	15 10	16 48	P.	2	18 57·0	19 9·2	18 58·1	19 18·1	19 5·6		
„ 22	11 16	12 39	C.	2	18 47·6	19 12·2	18 57·1	19 26·8	19 5·9	19 6·0	
„ 25	15 10	16 34	C.	2	18 45·9	19 14·9	18 58·4	19 25·9	19 6·2		
March 1	11 6	12 35	P.	2	18 46·9	19 11·7	18 57·4	19 26·9	19 5·7	19 5·8	19 6·0
„ 4	15 15	16 33	R.	2	18 46·2	19 13·2	18 58·1	19 26·6	19 6·0		
„ 8	10 15	11 40	C.	2	18 50·0	19 11·1	18 57·9	19 26·2	19 6·2	19 6·3	
„ 11	15 10	16 30	C.	2	18 47·2	19 13·5	18 58·4	19 27·2	19 6·5		
„ 15	10 14	11 40	R.	2	18 50·8	19 9·1	18 58·5	19 26·4	19 6·1	19 5·9	
„ 18	15 10	16 29	R.	2	18 50·6	19 9·4	18 57·4	19 25·9	19 5·8		
„ 22	10 25	12 1	C.	2	18 52·6	19 10·4	19 2·5	19 44·9	19 12·6		19 10·3
„ 23	10 58	12 20	R.	2	18 53·6	19 10·3	18 57·9	19 27·0	19 7·1		
„ 25	15 12	16 53	C.	2	18 48·9	19 10·1	18 58·6	19 44·9	19 10·6		
„ 29	10 13	11 49	R.	2	18 52·2	19 9·4	19 6·4	19 36·6	19 11·1		
April 1	15 0	16 17	R.	2	18 47·2	19 15·2	19 9·9	19 41·1	19 13·3		19 10·6
„ 5	10 18	11 49	C.	2	18 46·3	19 9·4	19 24·1	19 15·8	19 8·8		
„ 5	14 11	15 34	F.	2	18 43·4	19 23·7	18 55·4	19 37·4	19 9·9		
„ 8	15 10	16 36	C.	2	18 51·7	19 11·0	19 8·6	19 26·1	19 9·3		
„ 12	10 13	11 39	R.	2	18 45·9	19 17·4	19 3·7	19 19·2	19 6·5		
„ 12	13 50	15 1	F.	2	18 48·3	19 11·6	19 2·9	19 37·7	19 10·1		
„ 14	15 6	16 33	R.	2	18 47·1	19 13·2	19 1·3	19 44·9	19 11·6		
„ 19	10 15	11 44	C.	2	18 45·9	19 11·2	19 11·7	19 32·1	19 10·2		
„ 19	14 41	16 10	F.	2	18 47·3	19 18·1	19 5·9	19 37·1	19 12·1		
„ 22	15 16	16 46	C.	2	18 48·1	19 17·2	19 7·9	19 31·4	19 11·1		
„ 26	10 40	12 6	C.	2	18 48·1	19 17·2	19 4·5	19 26·7	19 9·1		
„ 26	15 12	16 48	F.	2	18 51·3	19 15·2	18 50·4	19 34·8	19 7·9		
„ 29	15 10	17 47	C.	2	18 50·9	19 30·1	19 7·9	19 31·2	19 15·0		
„ 30	15 47	17 16	C.	2	18 51·4	19 23·4	19 8·4	19 31·8	19 13·7		
May 3	10 15	11 48	C.	2	18 49·1	19 14·7	19 10·3	19 29·6	19 10·9		19 12·4
„ 3	14 33	16 10	F.	2	18 47·4	19 33·2	19 0·6	19 35·3	19 14·1		
„ 6	15 19	17 1	C.	2	18 50·3	19 12·0	19 11·7	19 30·6	19 11·1		
„ 10	10 25	12 0	P.	2	18 41·7	19 20·4	19 5·3	19 33·6	19 10·2		
„ 13	15 13	16 41	P.	2	18 43·0	19 20·9	19 7·7	19 31·6	19 10·7		
„ 14	14 31	15 53	F.	2	18 49·9	19 21·7	19 5·9	19 28·2	19 11·4		
„ 17	10 16	11 55	C.	2	18 50·5	19 22·1	19 11·9	19 27·4	19 12·9		
„ 20	15 12	16 41	C.	2	18 54·5	19 20·2	19 15·3	19 30·7	19 15·1		
„ 21	10 44	11 52	F.	2	18 52·2	19 19·1	18 56·7	19 37·1	19 11·2		
„ 21	15 2	17 5	C.	2	18 52·4	19 24·6	19 5·3	19 39·4	19 15·4		
„ 23	10 25	12 10	P.	2	18 44·2	19 22·2	19 11·9	19 31·7	19 12·5		
„ 27	15 5	16 40	P.	2	18 43·2	19 24·8	19 7·1	19 31·1	19 11·5		
„ 31	10 15	12 36	C.	2	18 49·7	19 32·6	19 1·1	19 35·2	19 14·6		

1870. Date.	Bombay Civil Time (0 to 24 hours). At Commencement.	Bombay Civil Time (0 to 24 hours). At Conclusion.	Observer.	Needle marked	End of Needle Dipping A Face of Circle East.	End of Needle Dipping A Face of Circle West.	End of Needle Dipping B Face of Circle East.	End of Needle Dipping B Face of Circle West.	Mean Dip.	Monthly Mean.	Weekly Mean.
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′		° ′
June 3	15 14	16 41	C.	2	18 50·1	19 26·6	19 1·1	19 35·1	19 13·2		19 8·0
„ 6	14 50	16 14	R.	13	18 23·3	18 57·1	19 26·6	20 18·1	19 16·2		
„ 7	10 22	12 14	R.	2	18 20·4	18 43·8	18 46·7	19 38·9	18 52·4		
„ 7	14 50	16 11	R.	13	17 35·7	18 26·8	19 18·9	20 3·3	18 51·1		
„ 10	15 11	16 30	R.	2	18 38·8	19 18·2	18 40·2	19 39·5	19 4·1		
„ 14	10 16	11 51	C.	2	18 43·1	19 18·3	18 55·4	19 33·2	19 7·5		
„ 14	15 10	16 33	C.	13	18 25·8	18 52·4	19 13·2	19 56·2	19 6·9		
„ 17	15 10	16 37	P.	2	18 40·6	19 25·4	19 15·7	19 37·7	19 14·8		
„ 18	15 6	16 32	P.	13	18 18·7	18 59·4	19 18·0	19 55·0	19 7·7		
„ 21	10 19	11 55	R.	2	18 45·9	19 21·7	18 46 7	19 33·2	19 6·8		
„ 21	13 2	14 14	F.	13	18 57·8	19 11·1	19 12·7	19 32·1	19 13·4		
„ 24	15 10	16 30	R.	13	18 37·7	19 8·4	19 32·9	19 52·4	19 17·8		
„ 28	10 22	11 52	C.	2	18 41·3	19 26·1	19 10·6	19 30·6	19 12·1		
July 1	15 10	16 35	R.	2	18 40·7	18 37·9	18 48·6	19 26·1	19 8·3		19 7·0
„ 5	10 13	11 50	R.	13	18 34·6	19 18·2	19 12·6	19 30·6	19 9·0		
„ 8	15 15	16 43	C.	13	18 43·3	19 2·4	19 15·0	19 21·8	19 5·6		
„ 12	10 13	11 48	C.	2	18 50·9	19 34·2	18 51·6	19 13·3	19 7·4		
„ 15	14 52	16 17	R.	2	18 43·4	19 41·9	18 41·0	19 25·3	19 7·8		
„ 19	10 15	11 55	R.	13	18 17·3	19 9·0	19 4·6	19 41·2	19 3·0		
„ 19	15 15	16 40	R.	13	18 16·5	19 2·9	19 3·9	19 41·8	19 1·2		
„ 22	15 0	16 34	R.	2	18 37·4	19 46·4	18 34·7	19 43·2	19 10·4		
„ 26	10 22	11 49	C.	2	18 47·7	19 32·1	18 56·6	19 14·3	19 7·6		
„ 29	15 7	16 34	R.	2	18 45·9	19 42·9	18 41·1	19 19·3	19 9·8		
August 2	10 46	12 13	C.	13	18 55·8	19 13·7	18 59·0	19 12·1	19 5·1		19 2·5
„ 5	15 10	16 32	C.	13	18 41·6	19 12·6	19 4·1	19 7·2	19 1·3		
„ 9	10 20	11 44	C.	2	18 35·8	19 38·2	18 43·9	19 4·3	19 0·5		
„ 12	15 10	16 34	C.	2	18 42·2	19 36·8	18 40·4	19 9·8	19 2·3		
„ 16	10 15	12 0	R.	13	18 33·3	19 28·4	18 54·9	19 11·1	19 1·9		
„ 19	15 9	16 34	R.	13	18 40·7	19 30·6	18 52·4	19 9·8	19 3·3		
„ 23	10 12	11 42	C.	2	18 47·3	19 27·2	18 43·4	19 7·7	19 1·3		
„ 23	15 58	17 38	F.	2	18 52·8	19 37·3	18 26·3	19 10·0	19 6·5		
„ 26	15 5	16 31	R.	2	18 31·2	19 35·8	18 23·2	19 34·1	19 1·0		
„ 30	10 10	11 44	R.	13	18 24·4	19 36·5	18 54·6	19 11·5	19 1·7		
Sept. 2	15 10	16 38	C.	13	18 53·5	19 12·9	18 47·9	19 8·2	19 0·6		19 1·3
„ 6	10 12	11 42	C.	2	18 42·6	19 21·4	18 41·2	19 12·2	18 59·3		
„ 9	15 5	16 30	R.	2	18 34·5	19 33·1	18 29·6	19 25·2	19 0·6		
„ 13	10 17	11 47	R.	13	18 27·7	19 13·2	18 43·6	19 31·9	18 59·0		
„ 16	15 10	16 38	C.	13	19 5·6	19 12·2	18 45·7	19 2·8	19 1·5		
„ 20	10 12	11 45	C.	2	18 40·0	19 26·4	18 41·6	19 13·5	19 0·3		
„ 23	15 0	16 24	R.	2	18 38·8	19 27·4	18 37·6	19 16·8	19 0·1		
„ 27	10 5	11 35	R.	13	19 6·1	19 21·2	18 50·5	19 6·8	19 6·1		
„ 30	15 10	16 34	C.	13	19 7·6	19 16·7	18 47·7	19 6·3	19 4·5		
Oct. 4	10 20	11 59	R.	2	18 44·0	19 25·9	18 40·6	19 13·5	19 0·9		19 7·4
„ 7	15 14	16 36	C.	13	18 40·6	19 1·7	18 59·6	19 29·6	19 2·8		
„ 11	10 23	11 43	R.	13	18 45·1	19 9·2	18 39·4	19 2·5	19 54·0		
„ 11	14 15	15 30	F.	13	18 57·1	19 38·1	18 45·7	19 46·3	19 16·8		
„ 11	16 1	17 9	R.	13	18 8·2	19 9·5	19 23·4	19 47·3	19 7·0		
„ 14	14 34	17 12	F.	2	19 1·1	19 51·0	18 23·6	19 15·1	19 7·6		
„ 14	15 5	16 34	R.	2	19 2·6	19 39·9	18 26·7	19 18·9	19 7·0		
„ 18	10 44	12 11	C.	2	19 0·9	19 33·9	18 28·9	19 21·7	19 6·3		
„ 21	14 40	17 [5]	F.	13	18 32·6	19 6·9	19 23·9	19 49·2	19 13·1		
„ 21	15 7	16 16	C.	13	18 33·8	19 5·2	19 17·6	19 47·3	19 10·9		
„ 25	11 23	12 56	R.	13	18 3·2	18 54·4	19 16·9	19 47·4	19 0·4		
„ 25	15 45	17 23	R.	13	18 28·4	19 5·9	19 23·9	19 59·7	19 14·4		
„ 28	15 10	17 34	R.	2	18 57·9	20 1·3	18 12·8	19 39·4	19 13·1		
„ 28	16 12	17 0	F.	2	18 59·6	20 8·1	17 56·9	19 30·4	19 8·7		
Nov. 1	10 50	12 10	C.	2	18 52·3	19 35·7	18 29·0	19 19·0	19 4·0		
„ 4	15 15	16 43	C.	13	18 25·6	19 2·9	18 58·6	20 12·8	19 9·9		
„ 8	11 0	12 37	R.	13	18 17·6	19 2·3	19 20·1	20 8·6	19 12·1		
„ 11	14 58	16 8	R.	2	18 42·8	20 10·6	18 16·8	19 36·9	19 11·7		
„ 15	11 0	13 43	C.	2	18 53·7	19 39·2	18 28·2	19 14·8	19 3·9		

1870.	Bomay Civil Time (0 to 24 hours).		Observer.	Needle marked	End of Needle Dipping				Mean Dip.	Weekly Mean.	Monthly Mean.
					A		B				
					Face of Circle		Face of Circle				
Date.	At Commencement.	At Conclusion.			East.	West.	East.	West.			
	h. m.	h. m.			° ′	° ′	° ′	° ′	° ′		° ′
Nov. 15	12 4	14 29	F.	2	18 39·4	19 38·2	18 25·6	19 19·3	19 0·6		19 6·4
„ 18	15 10	16 34	C.	13	18 25·4	18 59·1	19 11·6	20 7·5	19 10·8		
„ 22	10 18	11 43	R.	13	18 20·7	18 59·6	19 13·5	20 10·1	19 10·9		
„ 25	15 18	16 31	R.	2	18 45·8	19 51·2	18 20·9	19 35·1	19 8·2		
„ 29	10 17	11 44	C.	2	18 39·5	19 32·2	18 26·8	19 17·3	18 58·9		
„ 29	12 26	13 53	C.	2	18 49·6	19 31·1	18 27·6	19 17·8	19 1·5		
„ 29	14 30	15 57	C.	13	18 11·6	18 38·4	19 17·2	20 11·3	19 4·6		
Dec. 2	15 11	16 35	C.	13	18 19·5	18 59·9	19 6·9	20 9·5	19 8·9		19 8·8
„ 6	10 15	11 49	R.	13	18 25·6	18 57·0	19 8·7	20 14·9	19 11·5		
„ 9	15 15	16 35	R.	2	18 51·2	19 46·3	18 25·9	19 27·8	19 7·7		
„ 13	10 15	11 44	C.	2	18 56·5	19 34·1	18 31·3	19 19·0	19 5·2		
„ 16	15 19	16 41	C.	13	18 6·6	19 6·5	19 11·7	20 17·5	19 10·5		
„ 20	10 15	11 50	R.	13	18 18·9	18 42·6	19 15·6	20 32·7	19 12·4		
„ 23	15 16	16 37	C.	2	19 1·6	19 33·6	18 29·8	19 20·6	19 6·4		
„ 27	10 14	11 42	C.	2	18 56·1	19 34·1	18 26·4	19 20·3	19 4·1		
„ 30	15 15	16 45	C.	13	18 10·7	19 4·2	19 13·2	20 23·0	19 12·7		

The Mean Dip for the months January to March 1870 = 19 5·8
Do. do. March to December 1870 = 19 7·5

APPENDICES.

I. THE NORMAL WINDS OF BOMBAY.

II. ON THE SOLAR VARIATIONS OF MAGNETIC DECLINATION AT BOMBAY.

III. ON THE LUNAR VARIATIONS OF MAGNETIC DECLINATION AT BOMBAY.

IV. THE ABSOLUTE DIRECTION AND INTENSITY OF THE EARTH'S MAGNETIC FORCE AT BOMBAY; AND ITS SECULAR AND ANNUAL VARIATIONS.

V. DESCRIPTION OF A NEW SELF-REGISTERING RAIN-GAUGE, BY F. CHAMBERS.

APPENDIX I.

THE NORMAL WINDS OF BOMBAY.

By CHARLES CHAMBERS, Esq., F.R.S., Superintendent of the Colaba Observatory.

(*Published in the Bombay Builder, of June and August*, 1869.)

In the course of the year 1867 an instrument was erected at the Government Observatory at Colaba capable of furnishing perpetual registrations of the direction and movement of the wind. By means of these registrations, which have been continued regularly up to the present time, it is possible at a considerable expenditure of labour in calculation to deduce the normal direction and strength of the wind at different seasons of the year and different hours of the day. Such calculations have been completed for one complete year, viz., from June 1867 to May 1868, and it is believed that the results will not only interest meteorologists but be of sufficient use to engineers, nautical men and others to justify their publication in the *Bombay Builder* at an earlier period than that at which they would otherwise become generally available for use; besides which they will in this way become more widely known than if confined to a volume of strictly scientific observations and mixed up with other matters which are not of exceptional interest.

2. The instrument referred to was supplied to the Colaba Observatory through the Kew Committee of the British Association after being tested at the Kew Observatory, and it is of the same kind as those furnished more recently by the Meteorological Committee of the Royal Society to the new associated observatories of the Meteorological Department in various parts of the British Isles. The following description of it is extracted, with only such slight alterations as are needed on account of some small peculiarities of the Colaba instrument, from the Committee's Report for the year 1867:—

PRINCIPLES OF CONSTRUCTION OF THE ANEMOGRAPH.

The Anemograph adopted by the Meteorological Committee is that of Dr. Robinson, with certain mechanical modifications by Mr. Beckley.* A description of this instrument is given by Dr. Robinson in the Transactions of the Royal Irish Academy for June 10, 1850. The principle of its construction will be at once seen by referring to Plate IV., on the next page. We have here four hemispherical cups which revolve in a horizontal plane and communicate their motion to a vertical axis, the whole being so arranged as to reduce the friction to as small an amount as possible.

Now, in whatever direction the wind blows, these cups will always be driven round with the convex side foremost, since the air presses with more effect into the cup than against its outside. Dr. Robinson, who in the paper mentioned above has investigated the instrument very completely, has been led both by theory and experiment to the following conclusions:—

(1.) The velocity with which the centres of the hemispherical cups are moved is in all cases as nearly as possible equal to one-third of that with which the wind blows horizontally, without any reference to the direction in which it blows:

(2.) This relation between the velocities is independent of the size of the instrument, that is to say, of the length of the arms and of the diameter of the cups.

The following are the dimensions of the instruments supplied to all the observatories of the Meteorological Committee, with the exception of that of Armagh:—

Distance of centre of cups from centre of axle...	24 inches.
Diameter of cups	9 „

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* The Anemograph for the Colaba Observatory was made by Mr. R. W. Munro, Barbican, London.

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At Armagh Dr. Robinson retains the instrument of his construction, of which the following are the dimensions:—

Distance of centre of cups from centre of axle	23 inches.
Diameter of cups	12 „

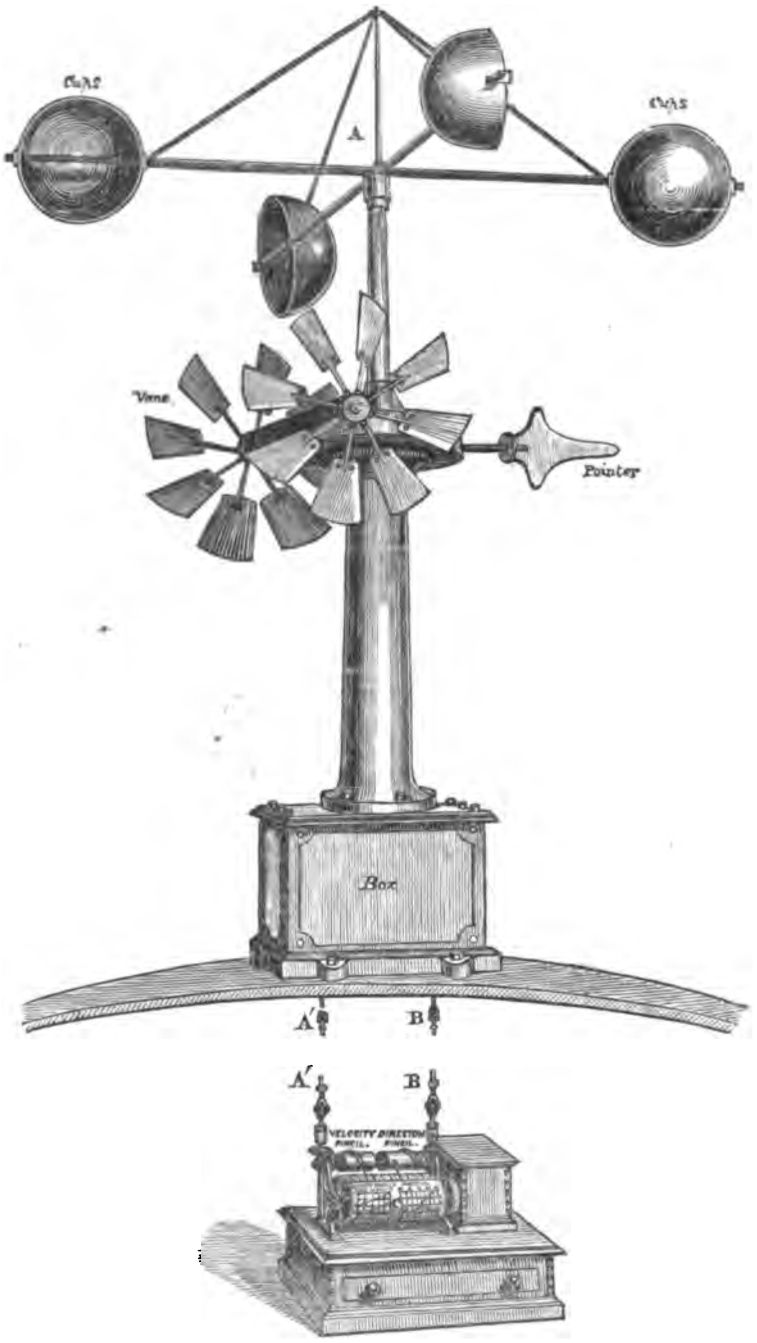
The cups at Armagh are, therefore, somewhat larger than those at the other Observatories, but this is of little consequence.

The following description refers to the instruments supplied by the Meteorological Committee, which differ somewhat in detail from Dr. Robinson's:—

Arrangement for Velocity.

The motion of the shaft A, which carries the cups and moves with them, is communicated vertically downwards to the box in the figure, where it is reduced in angular velocity by means of a train of wheels 7,000 times.

Plate IV.



The sooner this reduction of motion is accomplished the better, as the friction consequent on a long axle moving rapidly is thus avoided. After being reduced in this proportion the motion is communicated to the shaft A′, which therefore moves round once for every 7,000 revolutions described by the shaft A which carries the cups.

By an arrangement of bevelled wheels one revolution of this shaft A′ causes one revolution of a horizontal cylinder which carries the velocity pencil, in the shape of a spiral slip of brass projecting from its surface. This pencil presses on a sheet of prepared metallic paper which is wrapped round the cylinder C. This metallic paper has two scales engraved on it, one for velocity and the other for direction, and they are so arranged that for one revolution of A′ and hence of the cylinder carrying the spiral velocity pencil, this pencil shall trace a mark upon that part of the prepared paper ruled for velocity, extending from 0 to 50 (see Figure XLIV.).

Let us, before proceeding further, endeavour to find from Dr. Robinson's results, combined with a knowledge of the dimensions of these instruments, what horizontal distance the wind has travelled for one revolution of A′. The cups have during this time gone 7,000 times round. Now the distance between the centre of a cup and that of the shaft being 2 feet, the whole diameter of the circle described by the cups is 4 feet, and hence the whole circular path described by them in one revolution will be $4 \times 3{\cdot}1416 = 12{\cdot}5664$ feet. In 7,000 revolutions the whole path will therefore be $12{\cdot}5664 \times 7{,}000 = 87{,}965$ feet nearly. But if we suppose with Dr. Robinson that the wind moves three times as fast as the cups, the wind will during this time have moved horizontally through 263,895 feet, or in round numbers through 264,000 feet, or 50 miles; while therefore the velocity pencil has traced a mark on the velocity scale of the prepared paper extending over its whole breadth, or from 0 to 50, the wind has travelled over 50 miles. The figures on this scale are thus seen to denote the number of miles over which the wind has travelled horizontally. The cylinder C, like those of the other instruments* is carried round by clockwork once in 24 hours, and it has the same time scale as the cylinder of the other instruments. The paper which envelops it differs, however, from that which envelops the other cylinders in being not photographic paper, but prepared metallic paper capable of being marked by a brass pencil. It will be easily seen from the description now given that we cannot have in this instrument any arrangement for cutting off the light every two hours, since the process is not photographic but mechanical. Under the circumstances of the case it has been considered most convenient to have the prepared paper which covers the cylinder previously ruled, both with the time scale and with the other scale of the instrument; hence as this paper is carried round by clockwork, and as at the same time the velocity pencil is in motion, we shall have as the result of both these motions a series of slanting lines drawn by the velocity pencil upon the prepared paper similar to those shown in the figure. Each of these lines will denote a space of 50 miles described by the wind, and it will be noticed in the figure that when the spiral velocity pencil has marked 50 miles it leaves off at the left and commences again from 0 miles at the right. The appearance of the record traced in this manner in 24 hours will be seen by referring to a facsimile of one of the Colaba *anemograms* (Fig. XLIV.).

Arrangement for Direction.

The following is a brief description of that part of the instrument which records continuously the direction of the wind.

A reference to the following figure will show two windmill vanes having a common axle.

The joint axle of these two windmill vanes carries an endless screw, which gears into the teeth of a fixed toothed wheel, and the whole windmill arrangement is moveable, being delicately supported on friction rollers, so that this endless screw is at perfect liberty to travel along the periphery of the fixed toothed wheel, if the motion of the wind upon the fans inclines it to do so.

The whole apparatus being thus easily moveable, and the arrow head being placed as in the figure, it follows from the principle of windmill vanes, that the system will travel round the fixed wheel until the arrow head points to the direction in which the wind is blowing; when the system has taken this position the fans will be so placed with regard to the wind that there will be no longer any pressure tending to move them round.

This system has a hollow axle, shown in the figure, which hollow axle surrounds the central axle of the velocity spindle. This hollow axle will therefore go once round when the wind has completed one evolution, or it will move with any change of wind.

This hollow axle is connected with the shaft B (Plate IV.), so that one revolution of the hollow axle will cause one revolution of B, which will therefore move once round when the wind has moved once round. But B is connected with the spiral direction pencil in precisely the same way in which A′ was with the spiral velocity pencil. And this pencil will move over the whole breadth of the direction scale from the right to the left side when the wind has completed a whole revolution, moving from north to east, thence to south, thence to west, and on the north again; while if the wind goes the opposite way, the motion of the spiral pencil will also be in the opposite way, that is, from left to right, instead of from right to left, of the direction scale. It is unnecessary to say more than to refer our readers to Fig. XLV., which shows the direction of the wind during 24 hours.

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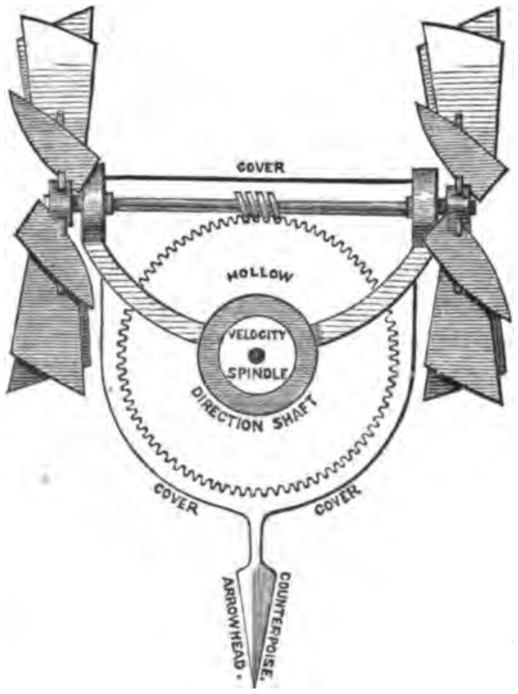
* The other instruments here alluded to are the Thermograph and Barograph previously described in the Report.

Fig 6.



3. Some slight modifications have been introduced in the curve-form in use at Colaba to facilitate—

1st.—The placing of the paper accurately upon the cylinder, so that the directions should be pretty exactly those indicated upon the form;

2ndly.—The exact setting of the paper cylinder for time at starting;

3rdly.—The reading off of the direction of the wind to be adopted for any given hour.

The first object is attained by wrapping the paper round the cylinder in such a way that the projecting line at the bottom of the direction form lies exactly over that at the top, and the latter exactly over a line cut in the brass cylinder at a position which has been found by observation to correspond to the direction "South." The direction spaces have also been made of unequal breadth to correspond with the lengths of the lines traced out by the pencil when the direction of the instrument is changed successively by angles of 22½ deg. (or 2 points) through the whole circle: the reason why these lengths are unequal is that the pencil which surrounds the direction-cylinder is not a true spiral, nor would it be an easy mechanical operation to make it so nearly perfect in form that the differences would be insensible. The setting for time is effected by pointing a pin projecting from a fixed frame towards the time scale on the left of the movement form: the time scale being subdivided into intervals of 15 minutes; this is easily done with considerable accuracy.

The middles of the spaces numbered 1, 2, 3, &c., correspond to the directions N.N.E., N.E., E.N.E., &c., and the numbers when multiplied by 22½ deg. thus represent the azimuth from North (reckoned by East, South, &c.,) of the direction from which the wind blows.

4. Numerical tabulations have been made of the movement and direction of the wind during the interval between any two successive hours in the following manner: the number of miles indicated at the point where the velocity trace cuts a horizontal hour-line being read for two successive hours, the excess of the latter over the former reading (adding 50 if the trace has passed over from left to right of the form) gives the movement for the interval; and the number of the space in which the direction trace lies during the interval is entered as representing the

direction : the estimations of movement are made only to the nearest full mile : should the direction trace not lie all in one space during the whole interval of an hour, then if the change of direction exceed 90° or eight points, the whole observation for that hourly interval is rejected, but if it lie within that limit the direction is estimated—by an inspection of the movement and direction traces together—from whence the aggregate flow of air was the greatest, and this direction is adopted for the full hour. Out of the full number of days (366) in the year the number wholly rejected, on account of incomplete traces from failure of the instrument or clock to act properly, is nine,—five of which were owing to an imperfect adjustment of the clock in the first fortnight of the period,—and of the remaining 8,568 hours 16 had to be rejected because the direction of the wind varied more than 4 points within the hour.

5. The method of reduction which has been adopted is to resolve the wind of every hourly interval into a north or south wind, and an east or west wind of such velocities, that if they blew together the observed movement and direction would be the same as is actually found. The formulæ by which these resolutions are effected are—

$$\text{Velocity of wind from North} = m \cos (n \times 22\tfrac{1}{2} \text{ deg.})$$
$$\text{Velocity of wind from East} = m \sin (n \times 22\tfrac{1}{2} \text{ deg.})$$

where m is the movement observed and n the number of the direction space under which the wind of the hourly interval is classed. When the sign of either of these calculated quantities is negative, it implies that the wind blows from the opposite direction, *i.e.* from South or West. The calculations are readily made by means of tables to the nearest tenth of a mile of velocity per hour. Having now substituted the two equivalent winds for the real one, we may with propriety proceed to combine together numbers of observations by algebraical addition and averaging, treating the North and East components of the wind each by themselves. The averages thus found from the observations of any given period will represent the velocity with which the wind must blow from the Northward (from the Southward if the sign of the average be negative) continuously for the whole period in order that total movement of the wind from that direction may be the same as the total movement from the same direction produced by the winds which actually blow ; and similarly the velocity with which it must blow continuously from the Eastward (Westward if the sign of the average be negative).

6. Such averages have been calculated for every hour of the day in each month of the year with the results shown in Table I., page 209. For example the first entry in that Table 6·0 S implies that the average of the north components of the winds which blew between midnight and 1 A.M. on all the days of June 1867 is −6·0, and the companion entry 13·0 W. that the average east component for the same period is −13·0. The averages are also represented graphically for each month by figs. I. to XII., the forms and curves of which we will now explain. On the form of each month is a centre which may be taken to represent calm; on the straight line projecting above and below it may be indicated north and south winds respectively, and similarly east and west winds on the straight line to the right and left of it respectively: the form is divided by thin red lines into squares whose sides represent 1 mile per hour of velocity, and by thicker red lines into squares whose sides are 5 miles ; also thin circular arcs are described from the centre point at intervals of 1 mile, and thicker arcs for every fifth mile. An illustration will best explain the setting off on this form of the winds of a particular month, let us say November 1867. Referring to Table I. we take out the components for the hour commencing at midnight 6·1 N. and 4·0 E., and making a point on the form 6·1 divisions above the line W. E. and 4·0 divisions to the right of the line N.S., we mark it with a figure 0 to indicate the hour that it refers to: proceeding similarly,—but placing the point below W.E. if the direction of the component be South, and to the left of N.S. if that of the other component be West,—till all the hours have been marked down, and joining up every two successive hours by a straight line, we obtain a curve which completely represents the normal winds of that month. With the construction described the lines drawn from each hourly point to the centre of the form represent, both in direction

and, by their lengths, in velocity, the single wind that is the equivalent of, or that which would produce the same motion of the air as the two component winds, and the lines joining the successive hourly points estimated in the same manner, the accession of wind gained in the several hourly intervals. The lengths of the hourly lines to the centre are easily read off by means of the successive circular arcs at distances of 1, 2, 3, &c., miles, and the directions by means of the radial lines which mark the successive points of the compass. A point surrounded by a small circle and joined to the centre by a black line is marked on each monthly figure to show the normal wind for all the hours. An inspection of the curves will now enable us to find the normal wind at any hour in any month : a few examples taken in this way may be given :—

Month.	Hour.	Normal Wind.	
		Direction.	Velocity. Miles per hour.
June	16	W. by S.	15·6
September	5	SW. by W.	6·8
November	0	NE. by N.	7·4
February	20	NW. by N.	10·2
April	16	NW. by W.	18·3

7. The curves being now intelligible we will proceed to notice some of the characteristics of the normal winds of Bombay as indicated by them : but first it will be well to explain the exact meaning attached to the word 'normal'; it is not of course intended to imply by it that all the winds blowing at a certain hour in a given month will be of the direction and strength indicated by the curves, but only that, as far as can be inferred from the year's observations under discussion, it is more probable that they will be of that direction and strength than of any other: in individual cases they will doubtless sometimes be stronger and sometimes weaker, sometimes from the right of that direction and sometimes from the left, but on the whole, in a month's time the winds that blow in excess of that indicated will just balance those that are in defect, and the additional winds from the right will neutralize those from the left. The winds just spoken of as being in excess and defect of the normal, or to the right and left of it, may be regarded as abnormal winds; and then we must regard the actual wind at any given time as made up of two parts, the normal due to causes ordinarily effective, and the abnormal due to variations in the effectiveness or power of those causes or to extraordinary causes. It would be convenient, though involving much labour of calculation, to analyse all meteorological phenomena in this manner so as to render it possible to compare together normal phenomena of one kind with normal of another, abnormal with abnormal; but it would be particularly helpful in tracing the progress of storms over large tracts of country if the knowledge of the normal winds —such as is exhibited in the curves for Bombay—extended to the whole district; for then it would be possible to compare the pure storm winds at one part with those at another with much greater prospect of arriving at the laws which regulate their recurrence than when the actual winds, in which the abnormal part is to some extent masked by the normal, are directly compared together. The force of this observation will be apparent if we suppose (merely for illustration) a storm wind of velocity 50 miles per hour blowing at Bombay all day in April from the SE. by E., when it will be seen from the curve of that month that the superposition of the normal winds at 7 A.M. and 4 P.M. would cause the actual velocities to be 50 miles and 31·7 miles respectively, whilst the real force of the storm wind was all the time 50 miles. It is convenient also to regard the normal winds of a given hour in a given month as made up of the normal wind of

the whole year, *plus* the annual inequality for the particular month, *plus* the diurnal inequality for the given hour; and it will then be seen that if the extremity of the monthly normal on each curve-form be assumed as the zero or centre of measurement, the lines drawn from each hourly point to that extremity will represent the diurnal inequality of the normal at the different hours, and the closed black curve will represent completely the diurnal variation. The representations of this curve may be regarded as the separated effects upon the wind of the sun's change of hour angle through a complete day: and similarly the curve in which the monthly and annual normals are shown (fig. XVII.) will represent the separated effects of the sun's change of declination through a whole year.

8. The first observation that we have to make is that there is a remarkable general likeness of character in the diurnal variations of all the dry months, October to May, the main point of difference being the somewhat less range of variation of the relatively cloudy months May and October: the main features of the curve are the regular sweep from right to left (rising somewhat and more especially at the later hours) between the hours 8 A.M. and 3 P.M. with greatest rapidity of change at the middle hours and least at the extreme; the systematic loop bending upwards and then to the right and downward again from 10 or 11 A.M. to 10 or 11 P.M., with rapid change at first, slow at the bend of the loop, and moderate and nearly uniform for the upper return branch of the loop: from 11 P.M. till 8 A.M. the curve proceeds onward, with some slight irregularities, from left to right. The systematic character of the whole curve is shown more distinctly in figs. XIV. and XV., where the mean diurnal variation of the normal wind is shown *by itself* for the months October to January and February to May. During the monsoon months, June to September, the range of the diurnal variation is—as might be expected from those months being almost entirely clouded—small as compared with that of the dry months. its curve has also lost the minor systematic features of the dry months' curves, but retains the principal feature, viz., that the hours 1 P.M. to 4 P.M., and generally the afternoon hours, lie to the left of the extremity of the monthly normal, whilst the hours 5 A.M. to 8 A.M. and generally the morning hours, lie to the right of it. Thus it is seen that the phenomena of land and sea breezes which this feature indicates are traceable, after a proper separation of the normal wind of the season, at all parts of the year as well during the monsoon as the dry months. But it is also seen that, although the theory of the land and sea breezes will satisfactorily explain the main feature of the diurnal variation of the wind, yet there is a great deal in the variation, as indicated in the curves for Bombay, of a perfectly definite and systematic character that without development so as to take into account the physical features of the country—shape, extent, elevations, dryness or moistness of soil, direction of coast line, &c.—the theory fails to explain. The mean diurnal variation for these four months is shown in fig. XIII., and for the whole year in fig. XVI., and the data for the construction of figs. XIII. to XVI. are given in Table II. To appreciate the full significance of the systematic form of the curves of diurnal variations as representing real phenomena, it must be remembered that each individual hour-point in the curves is found from observations that are perfectly independent of those which fix the points of the other hours.

With regard to the monthly normals, as exhibited in fig. XVII., the strongest winds are seen to prevail in the monsoon months, June to September, when the direction is from W. S.W. During the months November to May there is a gradual sweep round from the direction N.N.E. (through N.) to W., the normal force remaining all the time about half that of the monsoon months. In October the transition from the monsoon character to that of the month of November has only been partially accomplished.

9. There is another form of graphical representation of the diurnal variation of the wind (or of the whole composite wind) which,—although it has no exact counterpart in nature, the representation being only of an approximation to the facts,—will aid materially the forming of a distinct conception of the changes that actually take place; and perhaps be helpful to the

student who may speculate as to their cause. It supposes the variations of the place of observation to be common to, and simultaneous in, the whole of a district of moderate extent,—in the case of Bombay over a radius up to 70 miles—and shows then the position in the district of the same body of air from hour to hour, and the extent and form of the enclosure of the sphere of motion of such a body of air subject to the influence of the diurnal variation of the wind alone. The supposition involved is undoubtedly less true in the case of Bombay than it would be in a district comprising less variable physical features, but although the absolute motions indicated will be subject to correction, there can be no doubt from the systematic and generally similar appearance of the curves, that the relative motions at different hours and in different months are not very different from those shown on the curves. The figures XVIII. to XXX. here alluded to are on similar forms to those already described, that is, forms on which upward, downward, right and left lines from a central point represent the directions N., S., E., and W. respectively, and the sides of the squares formed by parallel lines to these are of lengths equivalent to 2 and 12 miles of motion of the air according as the lines are thin or thick. The numbers from which they are constructed are shown for each month and for the whole year in Table III., and the method of construction is exactly the same as that previously described, but it will be observed that, whereas the velocities are tabulated with reference to the directions *from* which the wind blows, the aggregate movements are tabulated with reference to the directions *towards* which it moves.

10. A possible useful application of these curves by mariners may be here described. During the dry months of the year, when sailing ships are obliged to beat along the coast depending for their progress mainly upon the land and sea breezes, and being frequently becalmed, it seems that even a rough guide as to the strength and direction of these winds at different distances from the coast, and at the successive hours of the day, would be of some advantage to captains in choosing their course; and such a guide the curves, with due allowances, appear to furnish. The explanation of the land and sea breezes at Bombay on the received theory is as follows:—As the sun rises in the heavens the soil in the interior of India becomes heated by solar radiation, and in its turn heats the air above it, which in consequence expands and overflows at the upper limiting surface of the atmosphere, a quantity of air being thus removed, the barometric pressure near the heated soil is diminished, and air flows in from the cooler regions to seaward to equalize the pressure; the flow continues above and below till the soil has attained nearly its mean temperature, or the temperature of the sea, which varies comparatively little in the course of the day. During the interval the temperature of the soil and the velocity with which the air flows both pass through their maxima, and that nearly simultaneously. At this period the lower flow of air is at Bombay, a west wind commencing about 11 A.M. or noon, with a maximum velocity at 3 or 4 P.M. and ceasing about 10 P.M. From this time the air begins to flow seaward, reaching its maximum velocity about 8 A. M., and ceasing about 11 A.M. or noon. The latter movement is thus explained by the theory; in the same manner that the soil absorbed more of the sun's rays than the sea, and thus became heated, so it radiates more heat into space, and after both have acquired the same temperature it cools the more rapidly; the air above it then becomes cooled, and condensed, and fresh air flows in—to maintain the level as it were—at the upper surface of the atmosphere. In consequence the barometric pressure increases, and the air begins to push itself out to seaward, where the same cause has been operating but less effectually to raise the barometer. The soil inland becoming by its superior radiation much cooler than the sea, the land breezes will continued to flow until the sun has again risen, and radiated sufficient heat upon the soil to restore the equilibrium of temperature between it and the sea; after which the same cycle of changes will again be gone through day by day.

11. It must not be supposed that the theory professes to account for the actual daily variations of barometric pressure; all that it requires is that, superposed upon the diurnal

variation of barometric pressure proper to the Indian Peninsula, there shall be a diurnal variation—it may be of much smaller magnitude—having a character approaching to opposition at the sea-board and in the interior of India. To test whether such a difference, which would be the measure of the secondary producing cause of the land and sea breezes, really exists, more complete and accurate observations in the interior are needed than are at present available. It will thus be seen that although the *absolute* maxima and minima of barometric pressure may occur nearly simultaneously over the whole of India,—the average difference of longitude of different places being less than *one hour*,—yet a relative or local difference of pressure such as is required by the theory may well have place at the same time.

12. Assuming the truth of the theory, it will be observed that in the case both of the sea and land breeze the secondary exciting cause lies in the interior of India, and that Bombay may be regarded as lying on the line which separates the land where the motion of the air originates from the sea, where it is expended, or from whence fresh air is derived; hence it is evident that whatever effects are produced at Bombay will be reproduced in a smaller degree to the seaward of Bombay; for when the pressure of the air is greater at Bombay than to seaward, part of its energy will be expended beyond in producing upward currents, and when it is less, part of the air which comes to equalize the pressure will come from above, and consequently the horizontal motion of the air to the seaward of Bombay will always be less than at Bombay.* It follows therefore that the curves XVIII. to XXX. which are constructed on the assumption that the winds in the neighbourhood are the same as at Bombay, will show a range of action exceeding the extreme limits to which the diurnal variation of the wind may be expected to be effective out to seaward. During the whole period, however, (from the middle of October to the middle of May,) when alone the land and sea breezes are needed for nautical purposes, they may be counted upon almost with certainty: and the indications of the curves which are applicable on the ocean to the westward of Bombay may doubtless be regarded as applicable in a less degree to a great part of the western coast of India. November is the month in which the land and sea breezes appear from the curves to be felt furthest out to sea; they are then confined much within a distance of 68 miles from the coast: in February, March and April the limit is about 6 miles less, and in December and January about 10 miles less. The conclusion we arrive at then is that to derive advantage at all from these breezes a ship must be kept well within the distances named—tacking suitably, yet so as never to get further than perhaps two-thirds of the limit indicated from the coast, and generally the nearer in-shore she is consistent with safety the greater, as is well known, will be the strength of the breezes and the advantage gained.

13. It is perhaps needful to remark that the curves XVIII. to XXIX. are concerned only with the variable part of a day's winds :—the part that blows steadily from a given direction throughout the whole of a day must be looked for with the proper month in fig. XVII., but the constancy of this part can be depended upon with much less certainty than in the case of the diurnal variation; it must nevertheless be allowed for in practice, in addition to the inequalities due to the varying hours; and it may be found from occasional observations, made on board ship, of the actual direction and velocity of the wind; for a simple graphical construction in which the observed wind forms one side of a triangle, the diurnal inequality for the particular hour another side, and the required " occasional normal" as we may call it, the remaining side, tells all that is wanted, and as often as the judgment of the navigator may lead him to repeat the observation. It is then only necessary to set off this normal from the extremity of the monthly

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* An objection may be made to this conclusion that similar considerations to those that lead to the necessity of land and sea breezes at Bombay would also require East and West breezes to be found, in a subdued form, at every part of the equator of a globe all land or all water, and these would be reproduced with full force to the westward of Bombay, but it is certain that the latter are of an order of magnitude feeble and incomparable with the main part of the diurnal variations of the wind at Bombay, and may be safely disregarded in a discussion of these variations, which has only a practical object in view.

normal of the particular month's curve (figs. I. to XII.), but in a contrary direction to its true one to find the centre to which lines must be supposed drawn from the successive hourly points to indicate the winds that will probably follow. Or this centre might be more simply found by setting off the wind observed at a given hour from the corresponding hour point in the curve but in a contrary direction; the point thus found will be the centre to be adopted until, from observation of the actual winds, it shall appear that the "occasional normal" has sensibly changed.

14. Similar considerations to those adduced in explanation of the diurnal variation applied to the annual period will explain the main feature of the annual variation of the wind: for referring to fig. XVII., and imagining a line in the direction about N. E. and S. W. drawn through the point marked "year," which must be regarded as the central point from which the monthly inequalities of direction and velocity are to be measured, it will be seen that the monthly points projected upon this line show a regular progession—on the south-west side of the centre from May to September, and on the north-east side from October to April, the maxima occurring in the middle months respectively of each period—and also that the variation is much greater in this direction than in any other. Now a direction line passing through Bombay and the southern part of the Asiatic Continent, with the condition that in one direction it should be bordered as much as possible by land, and in the other direction as much as possible by sea, would have nearly the direction N. E. and S. W., and on the land side, which is subject to a greater annual range of temperature than the sea side, will originate the atmospheric changes which cause the flow of currents from the seaward during the summer months and towards the sea in the colder months in the same manner as was explained in speaking of the land and sea breezes. In the annual variation, however, there are also, as in the diurnal variation, minor features of systematic change, the causes of which are yet to be ascertained.

15. The Table IV. and curves XXXI. to XLIII. have been constructed to show the mean velocity of the wind—without regard to its direction—at each hour in each month and in the whole year.

16. The force of the wind has been measured by its velocity rather than by its pressure, because to the meteorologist the chief significance of wind lies in the interchange of meteorological conditions that result from the transfer of bodies of air from districts in certain conditions to other districts where the conditions are different, and the quantity or extent of motion of the air bodily is the proper measure of this transfer: the same bodily motion of the atmosphere, carrying as part of it the vitiated air of populous towns and districts, and supplying its place by fresh air, pure or impure according to the influences to which it has been subjected in its previous course, is also the relation in which the wind affects sanitation. To the engineer or builder, however, who would regulate the strength of an elevated structure to the force of the winds that would strike it, the *maximum* pressure of the wind is the proper measure; the pressure is also proportional to the effectiveness of the wind in driving a ship through the sea, and is therefore the mariner's natural measure. The pressure is proportional to the square of the velocity, and therefore an average pressure will not be exactly the same as the pressure which coresponds to the average velocity of the same winds, but somewhat greater; neither can one be exactly calculated from the other, but they approach nearer to each other in value, the more nearly the individual winds are of equal strength, and as regards the normal winds herein treated, the pressures corresponding to the velocities may be safely used, as close approximations, for nautical purposes. The formula for reducing velocity (V) in miles per hour to pressure (P) in pounds on the square foot is

$$P = \frac{V^2}{200}$$

The diagrams and tables which accompany these pages were constructed by Mr. F. Chambers, who has also materially assisted in the reduction of the observations.

Table I.—*Showing the Mean Components of the Winds which blew at each Hour of the Day in each Month, from June* 1867 *to May* 1868, *resolved in the directions North or South, and East or West.*

Bombay Civil Hours (0 to 24)	June 1867.		July 1867.		August 1867.		Sept. 1867.		Oct. 1867.		Nov. 1867.		Dec. 1867.		Jan. 1868.		Feb. 1868.		March 1868.		April 1868.		May 1868.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
0—1	6·0 S	13·0 W	7·7 S	14·8 W	6·3 S	17·1 W	3·2 S	8·0 W	2·8 N	1·2 E	6·1 N	4·0 E	5·9 N	1·6 E	6·3 N	0·2 E	6·4 N	2·4 W	5·6 N	4·2 W	6·0 N	4·5 W	0·0	5·3 W
1—2	5·1 S	11·7 W	6·3 S	14·4 W	4·7 S	16·9 W	2·4 S	7·9 W	3·5 N	1·9 E	6·3 N	6·8 E	5·2 N	1·7 E	6·3 N	0·2 E	5·4 N	0·6 W	5·9 N	4·2 W	6·0 N	3·8 W	0·2 S	4·1 W
2—3	4·9 S	12·2 W	6·2 S	14·2 W	4·9 S	17·1 W	2·7 S	8·0 W	2·2 N	2·9 E	6·5 N	7·0 E	4·4 N	2·8 E	6·6 N	0·2 E	5·2 N	0·2 E	5·9 N	2·8 W	4·3 N	2·2 W	0·3 S	2·9 W
3—4	4·1 S	11·3 W	7·0 S	12·8 W	4·9 S	17·5 W	2·2 S	8·2 W	3·0 N	3·0 E	7·1 N	7·9 E	4·8 N	4·1 E	7·5 N	0·5 E	5·9 N	0·6 E	6·3 N	1·0 W	4·6 N	1·7 W	0·8 S	3·6 W
4—5	4·8 S	11·4 W	5·8 S	14·3 W	4·4 S	16·1 W	3·0 S	7·9 W	3·2 N	3·3 E	7·6 N	8·8 E	5·3 N	4·1 E	7·5 N	0·8 E	5·6 N	1·1 E	6·3 N	0·4 W	4·3 N	0·7 W	0·8 S	2·4 W
5—6	5·5 S	10·3 W	6·1 S	13·9 W	3·0 S	16·9 W	3·6 S	5·8 W	3·1 N	4·4 E	7·7 N	8·8 E	5·6 N	4·1 E	7·3 N	1·3 E	5·7 N	1·5 E	6·3 N	0·4 E	3·4 N	0·5 W	1·4 S	2·4 W
6—7	6·0 S	7·8 W	6·3 S	12·2 W	3·2 S	15·5 W	2·8 S	5·2 W	3·4 N	4·5 E	7·1 N	9·1 E	5·0 N	4·6 E	6·2 N	2·3 E	5·0 N	2·5 E	4·8 N	2·0 E	2·8 N	0·2 E	1·2 S	2·3 W
7—8	5·1 S	10·2 W	7·2 S	13·1 W	4·0 S	16·1 W	2·8 S	4·3 W	3·5 N	5·4 E	7·0 N	9·3 E	4·8 N	4·9 E	5·1 N	3·3 E	5·5 N	3·8 E	5·5 N	2·5 E	1·8 N	1·1 E	1·9 S	1·2 W
8—9	3·8 S	9·9 W	5·9 S	12·9 W	4·6 S	16·6 W	3·2 S	4·0 W	2·1 N	5·8 E	7·2 N	8·5 E	5·1 N	6·7 E	5·3 N	3·4 E	5·4 N	4·8 E	6·2 N	1·9 E	1·6 N	0·8 E	2·1 S	2·6 W
9—10	4·5 S	10·6 W	5·7 S	14·3 W	3·8 S	16·0 W	3·8 S	5·4 W	2·2 N	5·0 E	6·7 N	7·8 E	5·4 N	6·6 E	5·6 N	3·5 E	4·5 N	4·8 E	6·7 N	0·1 E	1·7 N	3·0 W	1·4 S	4·0 W
10—11	4·5 S	11·6 W	7·5 S	15·2 W	3·8 S	15·9 W	3·3 S	8·3 W	0·9 N	3·8 E	5·0 N	5·6 E	5·0 N	4·6 E	4·9 N	1·1 E	5·8 N	1·1 E	6·6 N	2·3 W	2·7 N	7·5 W	0·9 S	8·2 W
11—12	4·4 S	12·5 W	6·9 S	16·2 W	3·7 S	16·6 W	3·7 S	9·1 W	0·6 N	0·7 E	4·4 N.	3·9 E	4·5 N	2·3 E	5·9 N	1·5 W	6·2 N	3·0 W	7·1 N	8·6 W	4·5 N	11·1 W	1·0 S	10·6 W
12—13	5·1 S	13·1 W	4·7 S	18·1 W	3·0 S	18·9 W	3·4 S	10·6 W	3·4 N	3·7 W	5·4 N	1·0 E	5·3 N	2·3 W	7·0 N	6·6 W	7·3 N	9·1 W	7·5 N	12·9 W	6·4 N	14·8 W	0·3 N	13·6 W
13—14	3·2 S	14·1 W	5·6 S	19·2 W	3·5 S	17·8 W	3·3 S	10·5 W	3·9 N	5·6 W	6·3 N	5·6 W	6·6 N	5·7 W	8·3 N	9·5 W	7·7 N	11·0 W	8·6 N	13·9 W	8·1 N	15·7 W	1·0 N	14·0 W
14—15	2·5 S	15·4 W	5·7 S	18·3 W	4·7 S	18·6 W	1·9 S	11·3 W	5·5 N	7·8 W	7·9 N	7·3 W	7·3 N	8·1 W	9·9 N	11·2 W	7·9 N	12·3 W	10·0 N	14·9 W	9·2 N	15·9 W	1·4 N	15·6 W
15—16	2·6 S	16·0 W	6·5 S	18·7 W	3·5 S	19·6 W	1·4 S	11·7 W	6·3 N	9·4 W	8·9 N	8·0 W	8·4 N	9·0 W	10·9 N	11·6 W	8·8 N	12·6 W	10·8 N	16·1 W	9·5 N	15·6 W	2·3 N	15·9 W
16—17	3·1 S	15·3 W	5·9 S	16·9 W	2·9 S	17·5 W	1·2 S	12·0 W	7·3 N	9·1 W	9·8 N	8·0 W	8·7 N	9·0 W	12·1 N	10·5 W	9·3 N	11·6 W	11·3 N	14·1 W	10·1 N	15·3 W	2·2 N	14·6 W
17—18	4·1 S	15·0 W	4·7 S	17·5 W	3·0 S	18·1 W	1·4 S	11·2 W	8·2 N	7·5 W	10·7 N	7·4 W	9·7 N	8·4 W	12·2 N	9·5 W	9·8 N	11·2 W	11·1 N	12·5 W	9·3 N	14·8 W	2·6 N	13·1 W
18—19	3·7 S	14·7 W	5·2 S	16·9 W	3·3 S	17·8 W	1·5 S	9·6 W	7·8 N	5·2 W	11·8 N	5·7 W	10·4 N	7·3 W	12·6 N	8·0 W	10·0 N	9·3 W	10·3 N	10·9 W	8·8 N	12·9 W	2·3 N	10·9 W
19—20	4·0 S	13·9 W	6·5 S	15·4 W	3·7 S	17·2 W	2·0 S	9·9 W	7·8 N	2·6 W	12·0 N	4·5 W	11·2 N	5·8 W	12·4 N	7·0 W	9·8 N	7·6 W	9·5 N	9·2 W	6·4 N	9·2 W	2·0 N	7·9 W
20—21	4·8 S	12·6 W	6·5 S	15·4 W	4·4 S	16·1 W	2·0 S	8·7 W	5·8 N	0·6 W	10·7 N	3·0 W	9·5 N	3·9 W	10·0 N	4·2 W	8·4 N	5·9 W	7·6 N	6·4 W	6·8 N	8·1 W	1·5 N	7·4 W
21—22	5·4 S	12·5 W	7·0 S	14·9 W	4·6 S	16·6 W	2·7 S	8·5 W	4·8 N	0·5 W	9·3 N	0·9 W	7·8 N	1·5 W	8·6 N	2·3 W	7·6 N	4·2 W	5·4 N	4·6 W	7·2 N	8·0 W	0·8 N	6·8 W
22—23	4·9 S	12·8 W	7·8 S	15·8 W	4·8 S	17·0 W	3·0 S	9·4 W	3·3 N	1·5 E	7·1 N	0·7 E	6·9 N	0·0	7·3 N	0·7 W	6·4 N	2·9 W	5·1 N	4·1 W	6·5 N	7·1 W	0·7 N	6·4 W
23—24	5·1 S	12·5 W	7·3 S	14·2 W	5·5 S	15·6 W	2·5 S	8·4 W	2·4 N	2·1 E	5·3 N	2·8 E	6·5 N	0·3 E	6·3 N	0·1 W	6·1 N	2·3 W	5·6 N	4·1 W	5·3 N	6·1 W	0·4 N	5·7 W
Means	4·5 S	12·5 W	6·3 S	15·4 W	4·1 S	17·0 W	2·6 S	8·5 W	4·0 N	0·3 W	7·7 N	1·7 E	6·6 N	0·5 W	8·0 N	2·7 W	6·9 N	3·6 W	7·3 N	5·8 W	5·7 N	7·3 W	0·2 N	7·6 W

Table II.—*Showing the Diurnal Variation of the Mean Components (North or South and East or West) of the Winds which blew in each of the periods, June to September* 1867; *October* 1867 *to January* 1868; *February to May* 1868; *and June* 1867 *to May* 1868.

Bombay Civil Hours (0 to 24)	June to September 1867.		Oct. 1867 to Jan. 1868.		February to May 1868.		June 1867 to May 1868.	
	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.	N. or S.	E. or W.
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
0—1	1·4 S	0·1 E	1·3 S	2·2 E	0·5 S	2·0 E	1·1 S	1·4 E
1—2	0·2 S	0·6 E	1·3 S	3·1 E	0·7 S	2·9 E	0·7 S	2·2 E
2—3	0·3 S	0·4 E	1·7 S	3·7 E	1·2 S	4·2 E	1·1 S	2·7 E
3—4	0·1 S	0·9 E	1·0 S	4·4 E	1·0 S	4·7 E	0·7 S	3·3 E
4—5	0·1 S	0·9 E	0·7 S	4·7 E	1·2 S	5·5 E	0·7 S	3·7 E
5—6	0·1 S	1·6 E	0·7 S	5·1 E	1·5 S	5·9 E	0·8 S	4·2 E
6—7	0·2 S	3·1 E	1·2 S	5·6 E	2·2 S	6·7 E	1·2 S	5·1 E
7—8	0·4 S	2·4 E	1·5 S	6·2 E	2·3 S	7·6 E	1·4 S	5·4 E
8—9	0·0	2·5 E	1·7 S	6·6 E	2·2 S	7·3 E	1·3 S	5·4 E
9—10	0·0	1·7 E	1·6 S	6·2 E	2·1 S	5·6 E	1·3 S	4·5 E
10—11	0·4 S	0·6 E	2·7 S	4·3 E	1·5 S	1·9 E	1·5 S	2·2 E
11—12	0·3 S	0·3 W	2·8 S	1·8 E	0·8 S	2·2 W	1·3 S	0·3 W
12—13	0·4 N	1·9 W	1·3 S	2·4 W	0·4 N	6·5 W	0·2 S	3·6 W
13—14	0·5 N	2·1 W	0·3 S	6·1 W	1·3 N	7·5 W	0·5 N	5·3 W
14—15	9·7 N	2·6 W	1·0 N	8·1 W	2·1 N	8·6 W	1·3 N	6·5 W
15—16	9·9 N	3·2 W	2·0 N	9·0 W	2·8 N	8·9 W	1·9 N	7·1 W
16—17	1·1 N	2·1 W	2·9 N	8·6 W	3·2 N	7·8 W	2·4 N	6·2 W
17—18	1·1 N	2·1 W	3·6 N	7·7 W	3·2 N	6·8 W	2·6 N	5·6 W
18—19	1·0 N	1·4 W	4·0 N	6·0 W	2·8 N	4·9 W	2·6 N	4·2 W
19—20	0·4 N	0·8 W	4·2 N	4·5 W	1·9 N	2·4 W	2·2 N	2·6 W
20—21	0·0	0·1 E	2·4 N	2·4 W	1·1 N	0·8 W	1·1 N	1·1 W
21—22	0·5 S	0·2 E	1·0 N	0·8 W	0·2 N	0·2 E	0·2 N	0·2 W
22—23	0·7 S	0·4 W	0·5 S	0·9 E	0·3 S	1·0 E	0·5 S	0·4 E
23—24	0·7 S	0·6 E	1·5 S	1·8 E	0·7 S	1·6 E	0·9 S	1·3 E

Table III.—*Showing the aggregate Movement, in the directions North or South, and East or West, of the* SAME BODY OF AIR *as influenced solely by the Diurnal Variation of the Wind at Bombay, from its extreme easterly position to its position at each succeeding Hour of the Day in each Month, from June* 1867 *to May* 1868, *and for the whole Year.*

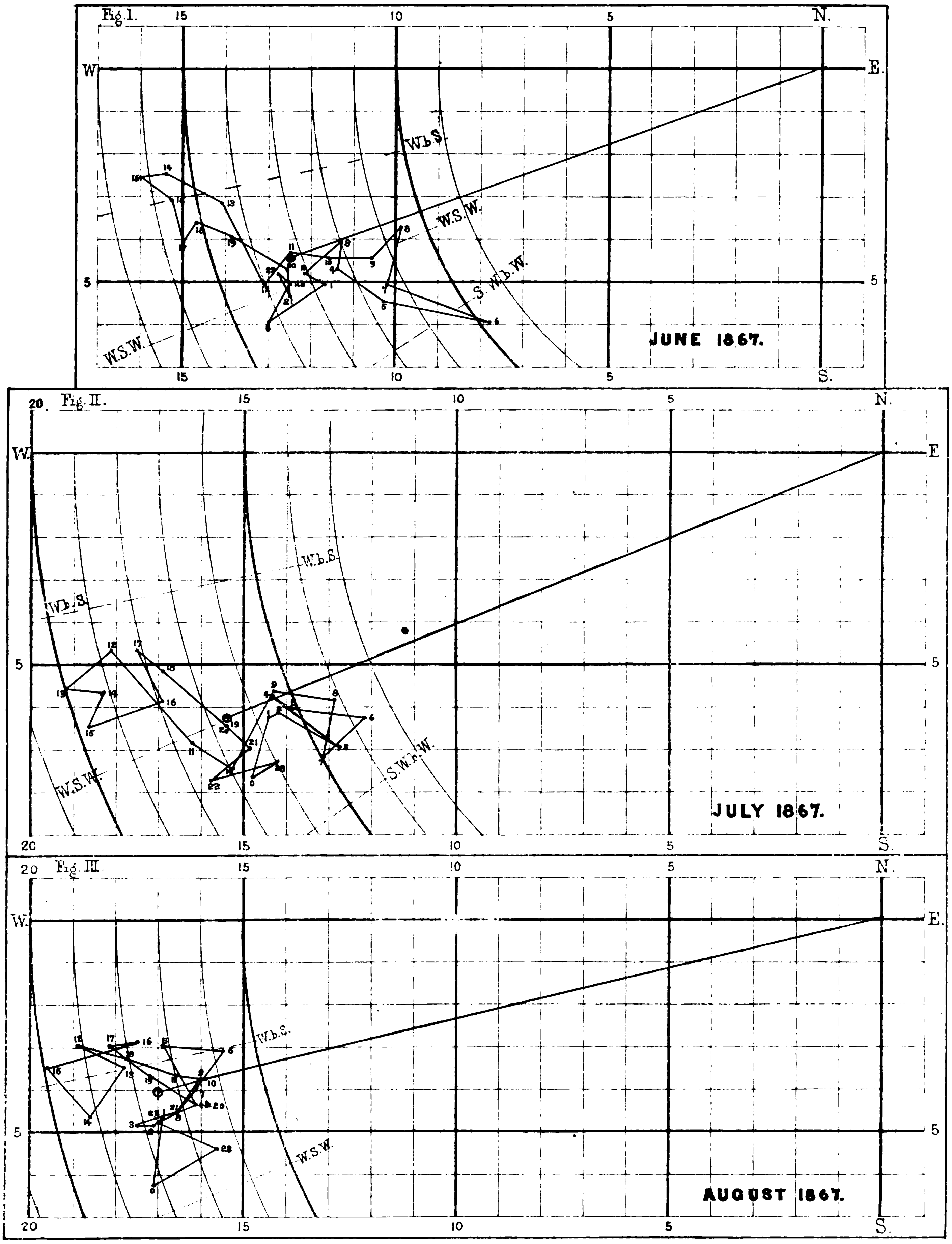
Bombay Civil Hours (0 to 24)	June 1867.		July 1867.		Aug. 1867.		Sept. 1867.		Oct. 1867.		Nov. 1867.		Dec. 1867.		Jan. 1868.		Feb. 1868.		March 1868.		April 1868.		May 1868.		Year.	
	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W	N or S	E or W
	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
0	1·5 S	0·5 W	2·8 N	1·3 W	3·1 N	3·8 W	0·7 S	0·0	3·3 N	3·5 W	1·5 N	0·3 W	0·7 N	1·9 W	1·9 N	6·1 W	1·4 N	1·2 W	6·6 N	5·7 W	0·1 N	2·6 W	1·9 S	3·2 W	1·5 N	2·6 W
1	0·0	0·0	4·2 N	1·9 W	5·3 N	3·7 W	0·1 S	0·5 W	4·5 N	5·0 W	3·1 N	2·6 W	1·4 N	4·0 W	3·6 N	9·0 W	1·9 N	2·4 W	8·3 N	7·3 W	0·2 S	5·4 W	17 S	5·5 W	2·6 N	4·0 W
2	0·6 N	0·8 W	4·2 N	2·9 W	5·9 N	3·8 W	0·3 S	1·1 W	5·0 N	7·2 W	4·5 N	7·7 W	2·8 N	6·2 W	5·3 N	11·9 W	3·4 N	5·4 W	9·7 N	8·9 W	0·5 S	8·9 W	1·3 S	9·0 W	3·3 N	6·2 W
3	1·0 N	1·1 W	4·1 N	4·1 W	6·7 N	3·7 W	0·2 S	1·6 W	6·8 N	10·4 W	5·7 N	13·0 W	5·0 N	9·5 W	6·7 N	14·8 W	5·1 N	9·2 W	11·1 N	11·9 W	0·9 N	14·0 W	0·8 S	13·7 W	4·4 N	8·9 W
4	0·6 N	2·3 W	4·8 N	6·7 W	7·5 N	3·2 W	0·6 S	1·9 W	7·8 N	13·7 W	6·3 N	19·2 W	6·8 N	14·1 W	7·2 N	18·0 W	6·1 N	13·4 W	12·1 N	16·7 W	2·0 N	19·6 W	0·2 N	17·7 W	5·1 N	12·2 W
5	0·9 N	3·4 W	4·3 N	7·8 W	7·8 N	4·1 W	0·2 S	2·5 W	8·6 N	17·3 W	6·4 N	26·3 W	8·1 N	18·7 W	7·7 N	21·5 W	7·4 N	18·1 W	13·1 N	22·1 W	3·4 N	26·2 W	1·2 N	22·9 W	5·8 N	15·9 W
6	1·9 N	5·6 W	4·1 N	9·3 W	6·7 N	4·2 W	0·8 N	5·2 W	9·5 N	22·0 W	6·4 N	33·4 W	9·1 N	23·3 W	8·4 N	25·5 W	8·6 N	23·2 W	14·1 N	28·3 W	5·7 N	33·0 W	2·8 N	28·1 W	6·6 N	20·1 W
7	3·4 N	10·3 W	4·1 N	12·5 W	5·8 N	5·7 W	1·0 N	8·5 W	10·1 N	26·8 W	7·0 N	40·8 W	10·7 N	28·4 W	10·2 N	30·5 W	10·5 N	29·3 W	16·6 N	36·1 W	8·6 N	40·5 W	4·2 N	33·4 W	7·8 N	25·2 W
8	4·0 N	12·6 W	5·0 N	14·8 W	5·7 N	6·6 W	1·2 N	12·7 W	10·6 N	32·5 W	7·7 N	48·4 W	12·5 N	33·8 W	13·1 N	36·5 W	11·9 N	36·7 W	18·4 N	44·4 W	12·5 N	48·9 W	6·3 N	39·8 W	9·2 N	30·6 W
9	3·3 N	15·2 W	4·6 N	17·3 W	6·2 N	7·0 W	1·8 N	17·2 W	12·5 N	38·6 W	8·2 N	55·2 W	14·0 N	41·0 W	15·8 N	42·6 W	13·4 N	45·1 W	19·5 N	52·1 W	16·6 N	57·0 W	8·6 N	44·8 W	10·5 N	36·0 W
10	3·3 N	17·1 W	4·0 N	18·4 W	5·9 N	8·0 W	3·0 N	20·3 W	14·3 N	43·9 W	9·2 N	61·3 W	15·2 N	48·1 W	18·2 N	48·8 W	15·8 N	53·5 W	20·1 N	58·0 W	20·6 N	61·3 W	10·2 N	48·4 W	11·8 N	40·5 W
11	3·3 N	18·0 W	5·2 N	18·6 W	5·6 N	9·1 W	3·7 N	20·5 W	17·4 N	48·0 W	11·9 N	65·2 W	16·8 N	53·2 W	21·3 N	52·6 W	16·9 N	58·2 W	20·8 N	61·5 W	23·6 N	61·1 W	11·3 N	47·8 W	13·3 N	42·7 W
12	3·2 N	18·0 W	5·8 N	17·8 W	5·2 N	9·5 W	4·8 N	19·9 W	20·8 N	49·0 W	15·2 N	67·4 W	18·9 N	56·0 W	23·4 N	53·8 W	17·6 N	58·8 W	21·0 N	58·7 W	24 8 N	57·3 W	12·5 N	44·8 W	14·6 N	42·4 W
13	3·8 N	17·4 W	4·2 N	15·1 W	4·1 N	7·6 W	5·6 N	17·8 W	21·4 N	45·6 W	17·5 N	66·7 W	20·2 N	54·2 W	24·4 N	49·9 W	17·2 N	53·3 W	20·8 N	51·6 W	24·1 N	49·8 W	12·4 N	38·8 W	14·8 N	38·8 W
14	2·5 N	15·8 W	3·5 N	11·3 W	3·5 N	6·8 W	6·3 N	15·8 W	21·5 N	40·3 W	18·9 N	59·4 W	20·2 N	49·0 W	24·1 N	43 1 W	16·4 N	45·9 W	19·5 N	43·5 W	21·7 N	41·4 W	11·6 N	32·4 W	14·3 N	33·5 W
15	0·5 N	12·9 W	2·9 N	8·4 W	4·1 N	5·2 W	5·6 N	13·0 W	20·0 N	32·8 W	18·7 N	50·4 W	19·5 N	41·4 W	22·2 N	34·6 W	15·4 N	37·2 W	16·8 N	34·4 W	18·2 N	32·8 W	10·4 N	24·4 W	13·0 N	27·0 W
16	1·4 S	9·4 W	3·1 N	5·1 W	3·5 N	2·6 W	4·4 N	9·8 W	17·7 N	23·7 W	17·5 N	40·7 W	17·7 N	32·9 W	19·3 N	25·7 W	13·5 N	28·2 W	13·3 N	24·1 W	14·4 N	24·5 W	8·3 N	16·1 W	11·1 N	19·9 W
17	2·8 S	6·6 W	2·7 N	3·6 W	2·3 N	2·1 W	3·0 N	6·3 W	14·4 N	14·9 W	15·4 N	31·0 W	15·6 N	24·4 W	15·2 N	17·9 W	11·1 N	20·2 W	9·3 N	15·8 W	10·0 N	16·5 W	6·3 N	9·1 W	8·7 N	13·7 W
18	3·2 S	4·1 W	1·1 N	1·5 W	1·2 N	1·0 W	1·8 N	3·6 W	10·2 N	7·7 W	12·4 N	21·9 W	12·5 N	16·5 W	11·0 N	11·1 W	8·2 N	12·6 W	5·5 N	9·1 W	6·4 N	9·0 W	3·9 N	3·6 W	6·1 N	8·1 W
19	4·0 S	1·9 W	0·0	0·0	0·4 N	0·2 W	0·7 N	2·5 W	6·4 N	2·8 W	8·3 N	14·5 W	8·7 N	9·7 W	6·4 N	5·8 W	5·1 N	6·9 W	2·5 N	4·0 W	3·3 N	3·4 W	1·8 N	0·3 W	3·5 N	3·9 W
20	4·5 S	0·5 W	0·2 N	0·0	0·0	0·0	0·1 N	1·3 W	2·6 N	0·5 W	4·0 N	8·3 W	4·1 N	4·4 W	2·0 N	1·5 W	2·2 N	2·9 W	0·3 N	0·6 W	2·6 N	1·5 W	0·0	0·0	1·3 N	1·3 W
21	4·2 S	0·4 W	0·4 N	0·0	0·3 N	0·9 W	0·5 S	0·9 W	0·8 N	0·2 W	1·0 N	3·6 W	1·2 N	1·0 W	0·0	0·0	0·7 N	0·6 W	0·0	0·0	1·5 N	0·7 W	1·3 S	0·2 W	0·2 N	0·2 W
22	3·3 S	0·4 W	1·1 N	0·5 W	0·8 N	1·3 W	0·4 S	0·9 W	0·0	0·0	0·6 S	1·0 W	0·0	0·0	0·6 S	0·4 W	0·0	0·0	1·9 N	1·2 W	0·0	0·0	1·9 S	1·0 W	0·0	0·0
23	2·9 S	0·1 W	2·6 N	0·1 W	1·5 N	1·3 W	0·0	0·0	0·7 N	1·8 W	0·0	0·0	0·3 S	0·5 W	0·1 N	2·4 W	0·5 N	0·7 W	4·1 N	2·9 W	0·8 S	0·2 W	2·4 S	2·2 W	0·5 N	0·4 W
24	2·3 S	0·1 W	3·6 N	1·3 W	2·9 N	2·7 W	0·1 S	0·1 W	2·3 N	2·8 W	2·4 N	1·1 W	0·2 S	1·3 W	1·8 N	5·0 W	1·3 N	2·0 W	5·8 N	4·6 W	0·4 S	1·4 W	2·6 S	4·1 W	1·4 N	1·7 W

Table IV.—*Showing the Mean Velocity—without regard to direction—of the Winds which blew at Bombay at each Hour of the Day in the Months June* 1867 *to May* 1868, *in miles per hour.*

Bombay Civil Time.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Year.
H H	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	Miles.
0 to 1	16·0	18·1	19·0	12·3	7·7	8·2	6·7	7·3	7·9	9·0	11·2	7·6	10·9
1 „ 2	14·9	17·9	18·1	13·2	7·9	10·1	5·8	7·6	7·3	9·3	10·7	7·0	10·8
2 „ 3	15·1	17·8	18·4	13·2	7·5	10·6	5·7	8·0	7·1	8·6	8·2	6·4	10·5
3 „ 4	14·7	18·7	18·5	13·0	7·5	11·6	7·0	8·8	7·4	9·1	8·1	6·7	10·9
4 „ 5	14·7	18·3	17·4	12·8	7·5	12·6	7·4	8·8	7·4	9·0	7·7	6·7	10·9
5 „ 6	14·7	19·0	17·9	13·3	7·9	12·5	7·9	8·5	7·2	8·5	7·6	6·1	10·9
6 „ 7	14·4	18·1	16·7	11·8	7·8	12·3	7·6	8·1	7·1	8·1	6·8	5·5	10·4
7 „ 8	14·3	18·4	17·5	11·5	8·6	13·0	7·7	8·2	8·0	9·0	8·3	7·1	11·0
8 „ 9	13·3	19·9	17·9	12·6	9·2	12·5	9·2	8·1	8·6	9·0	8·7	7·3	11·4
9 „ 10	14·0	20·5	17·3	13·2	8·7	11·7	8·9	8·7	7·8	9·7	9·0	8·3	11·5
10 „ 11	15·0	19·5	17·2	13·2	9·0	9·2	7·6	7·6	8·6	10·4	11·4	10·2	11·6
11 „ 12	15·2	19·6	17·9	13·6	9·5	7·8	6·4	8·7	9·8	13·1	13·9	12·2	12·3
12 „ 13	17·0	21·4	19·7	14·0	11·3	9·6	7·7	12·2	12·6	16·2	17·3	14·9	14·5
13 „ 14	17·7	22·3	19·5	13·7	12·4	10·7	10·1	14·3	14·1	17·4	18·6	15·2	15·5
14 „ 15	18·1	21·3	20·5	13·8	13·5	13·1	11·8	16·6	16·2	19·1	19·2	16·6	16·7
15 „ 16	18·4	21·7	20·9	13·7	15·0	14·7	13·1	17·4	16·9	20·5	19·6	17·2	17·4
16 „ 17	17·0	19·6	19·0	13·3	14·2	14·5	13·0	17·4	16·4	19·3	19·2	16·0	16·6
17 „ 18	17·7	19·8	19·4	12·8	13·7	14·5	13·4	16·6	15·8	17·7	18·4	14·2	16·2
18 „ 19	16·6	19·5	19·1	12·1	12·5	14·3	13·1	15·7	14·4	15·9	16·9	11·9	15·2
19 „ 20	16·2	18·6	18·1	11·7	12·1	13·8	12·9	14·9	12·9	13·9	13·8	9·3	14·0
20 „ 21	15·3	18·8	17·1	11·1	9·9	11·6	10·7	11·5	10·9	10·8	12·8	8·5	12·4
21 „ 22	15·5	18·6	17·6	11·6	7·6	9·8	8·5	9·7	9·7	9·1	12·9	8·9	11·6
22 „ 23	15·6	19·3	18·2	12·5	7·9	7·9	7·6	8·0	8·3	8·6	12·7	8·3	11·2
23 „ 24	15·3	18·2	17·1	11·6	7·5	7·4	7·2	6·9	7·7	8·6	11·7	7·4	10·5
Monthly Means...	15·7	19·4	18·3	12·7	9·8	11·4	9·0	10·8	10·4	12·1	12·7	10·0	12·7

PLATE XX.

CURVES showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY at each hour of the day in the months June, July, and August, 1867.



The figures placed along the course of the Curves represent, *when increased by half an hour*, the hours of the Bombay Civil Day : thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M.

The numbers on the margin of each Curve-form represent miles her hour of velocity.

PLATE XXI.

CURVES showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY at each hour of the day in the months September, October, and November 1867.

Fig. IV.

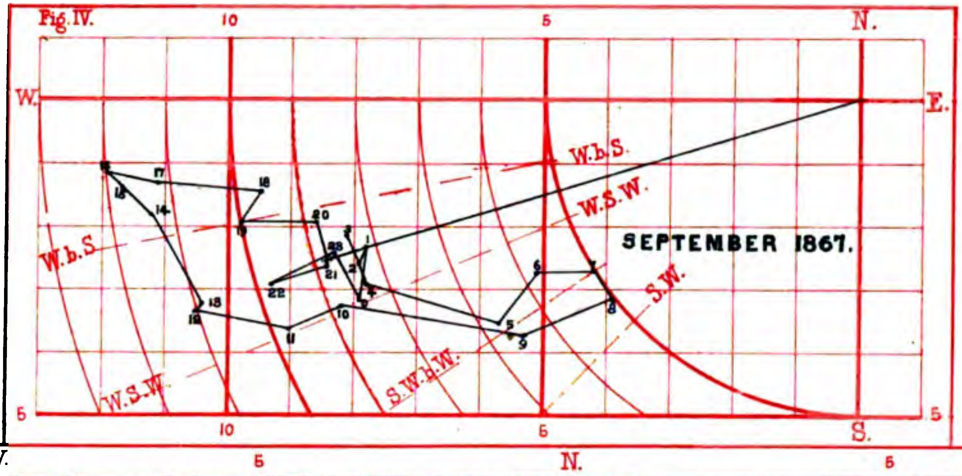


Fig. V.

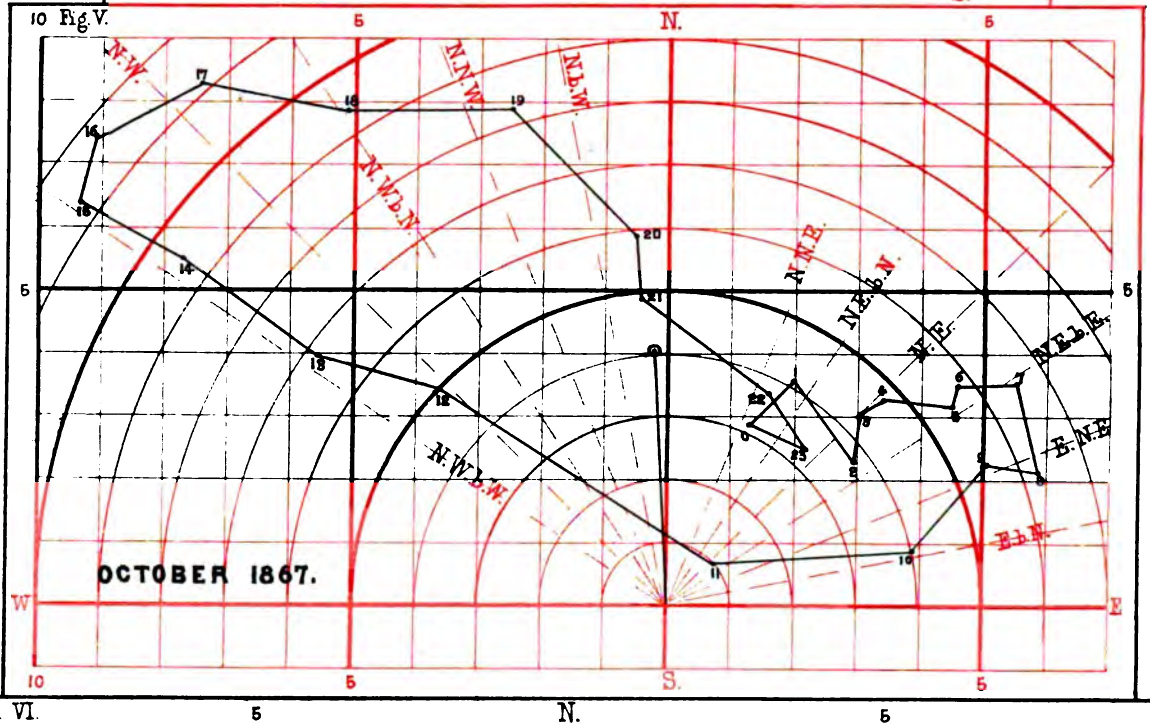
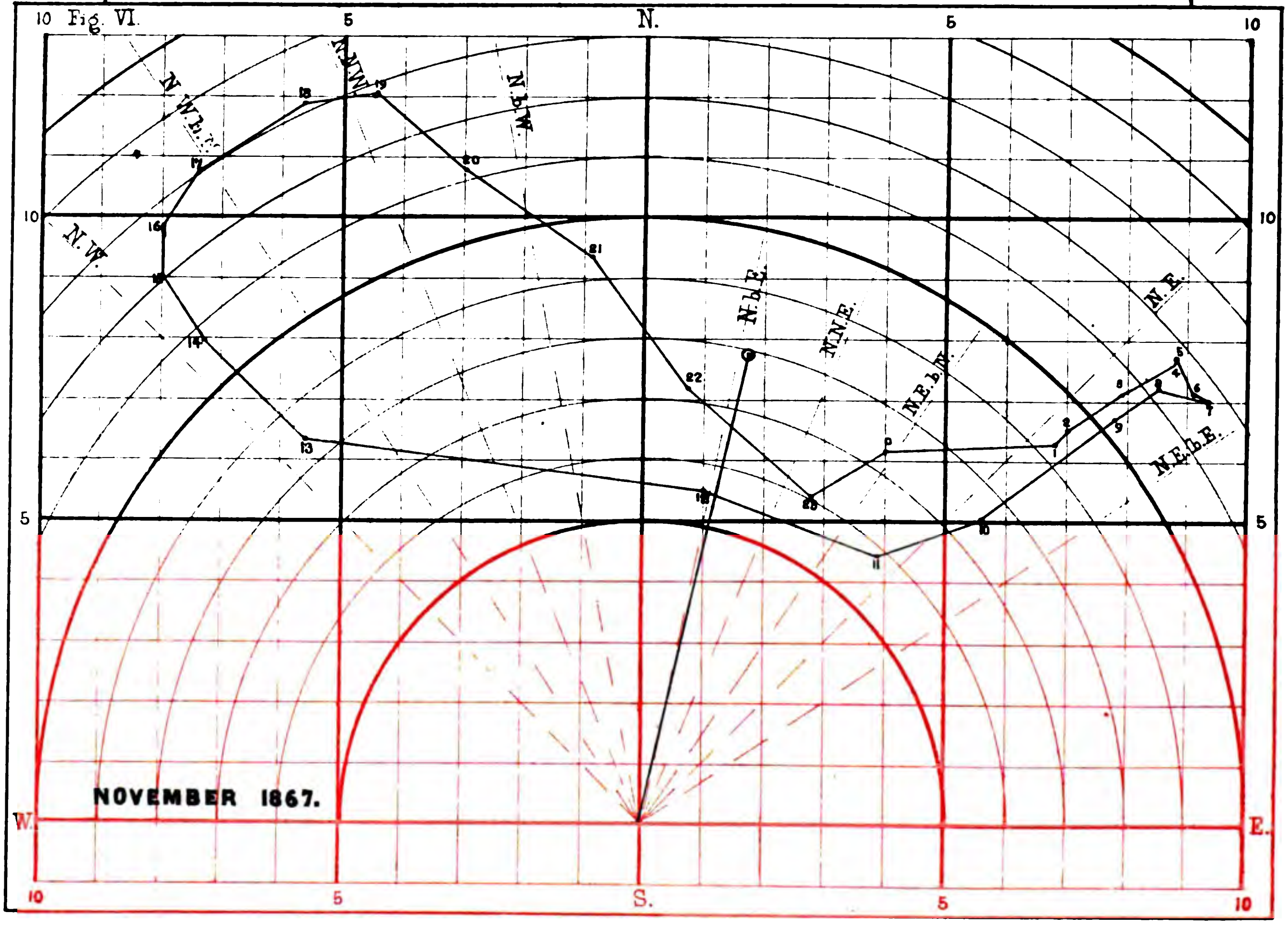


Fig. VI.



The figures placed along the course of the Curves represent, *when increased by half an hour,* the hours of the Bombay Civil Day: thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M.

The numbers on the margin of each Curve-form represent miles per hour of velocity.

PLATE XXII.

CURVES showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY at each hour of the day in the months December 1867 and January 1868.

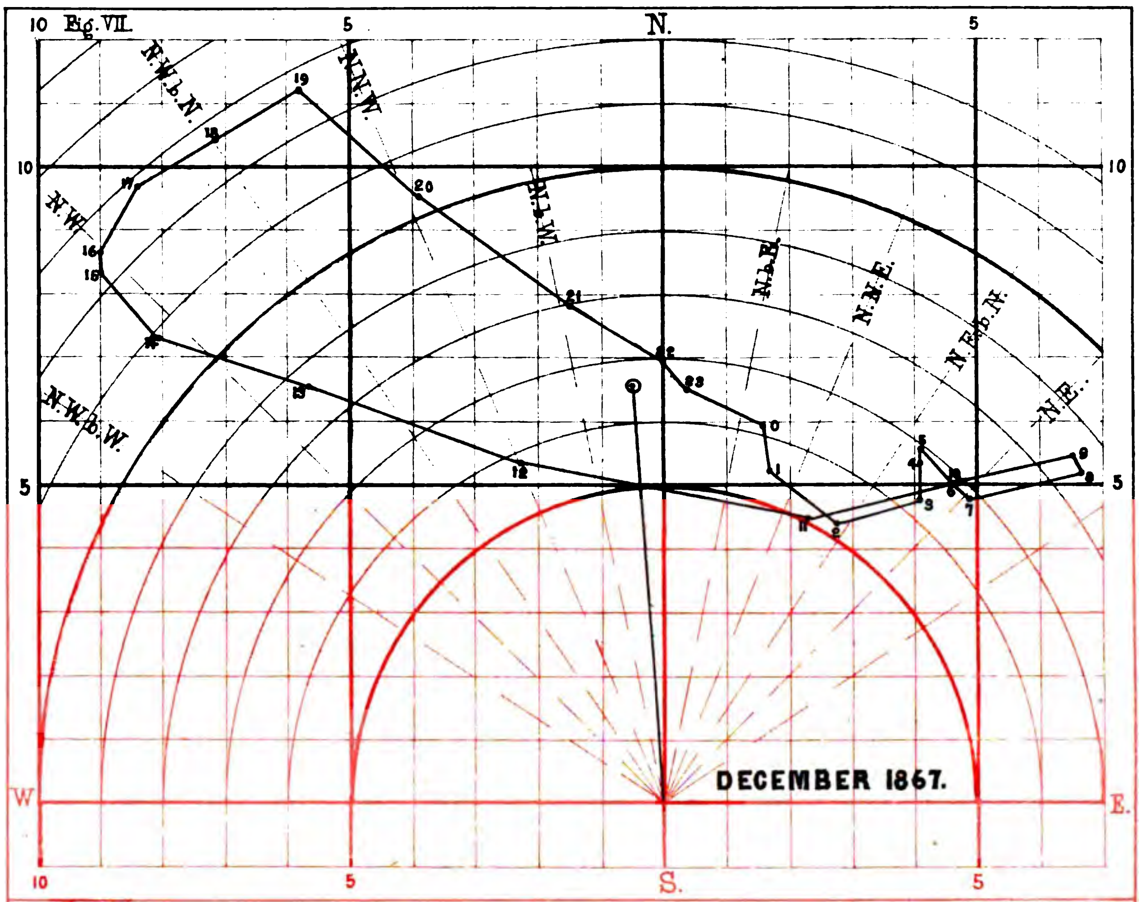


Fig. VII.

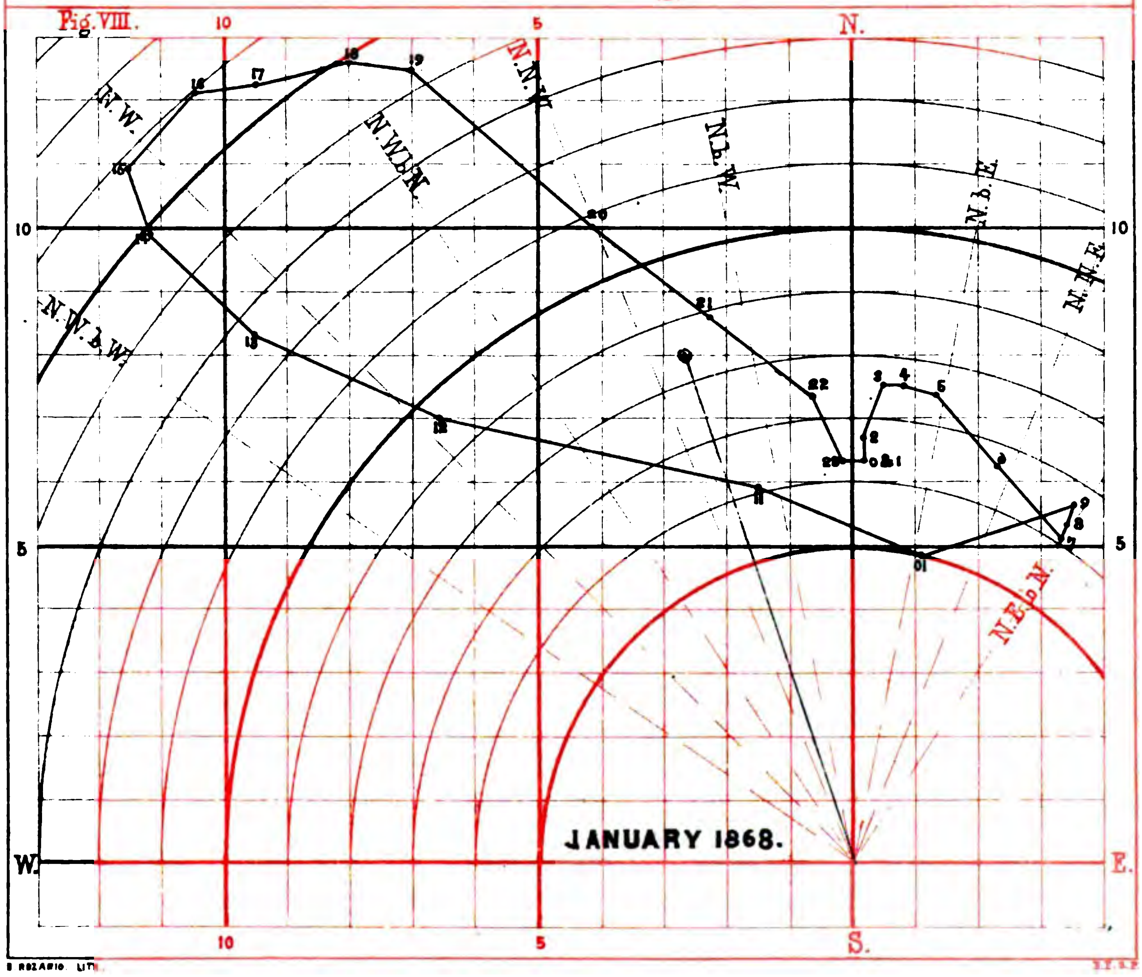


Fig. VIII.

E. ROZARIO LITH.

The figures placed along the course of the Curves represent, *when increased by half an hour,* the hours of the Bombay Civil Day : thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M.

The numbers on the margin of each Curve-form represent miles per hour of velocity.

PLATE XXIII.

CURVES showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY at each hour of the day in the months February and March 1868.

Fig. IX.

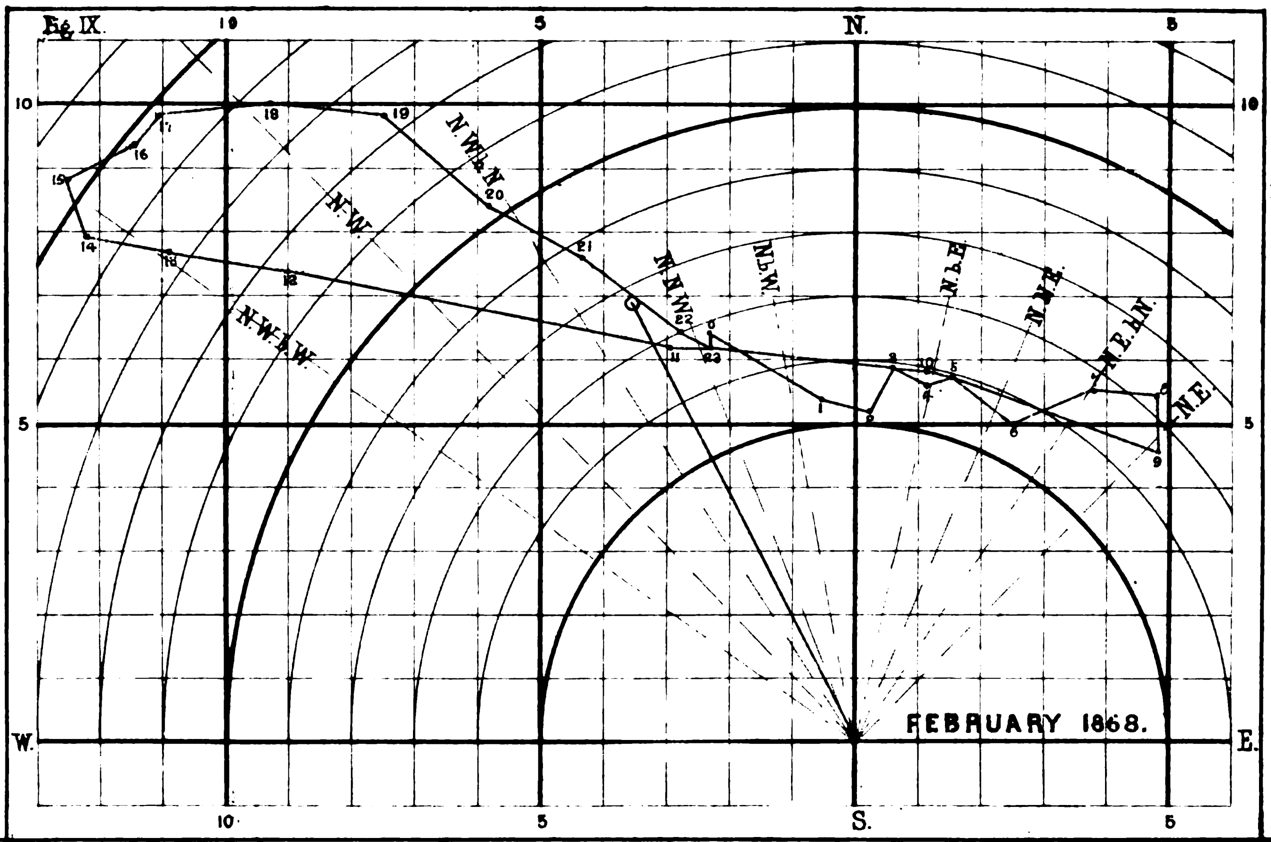
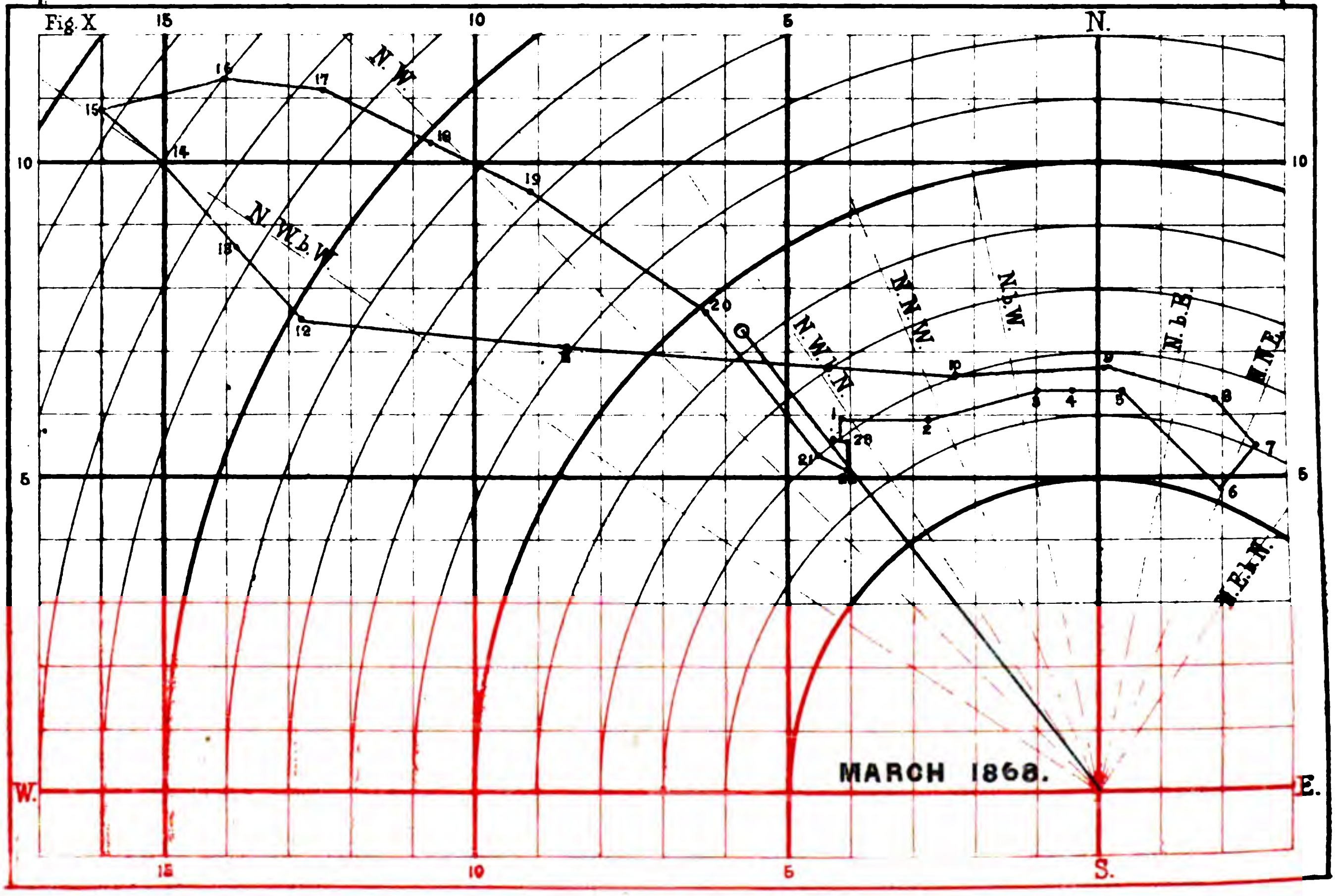


Fig. X



The figures placed along the course of the Curves represent, *when increased by half an hour*, the hours of the Bombay Civil Day: thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M. The numbers on the margin of each Curve-form represent miles per hour of velocity.

PLATE XXIV.

CURVES showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY at each hour of the day in the months April and May 1868.

Fig. XI.

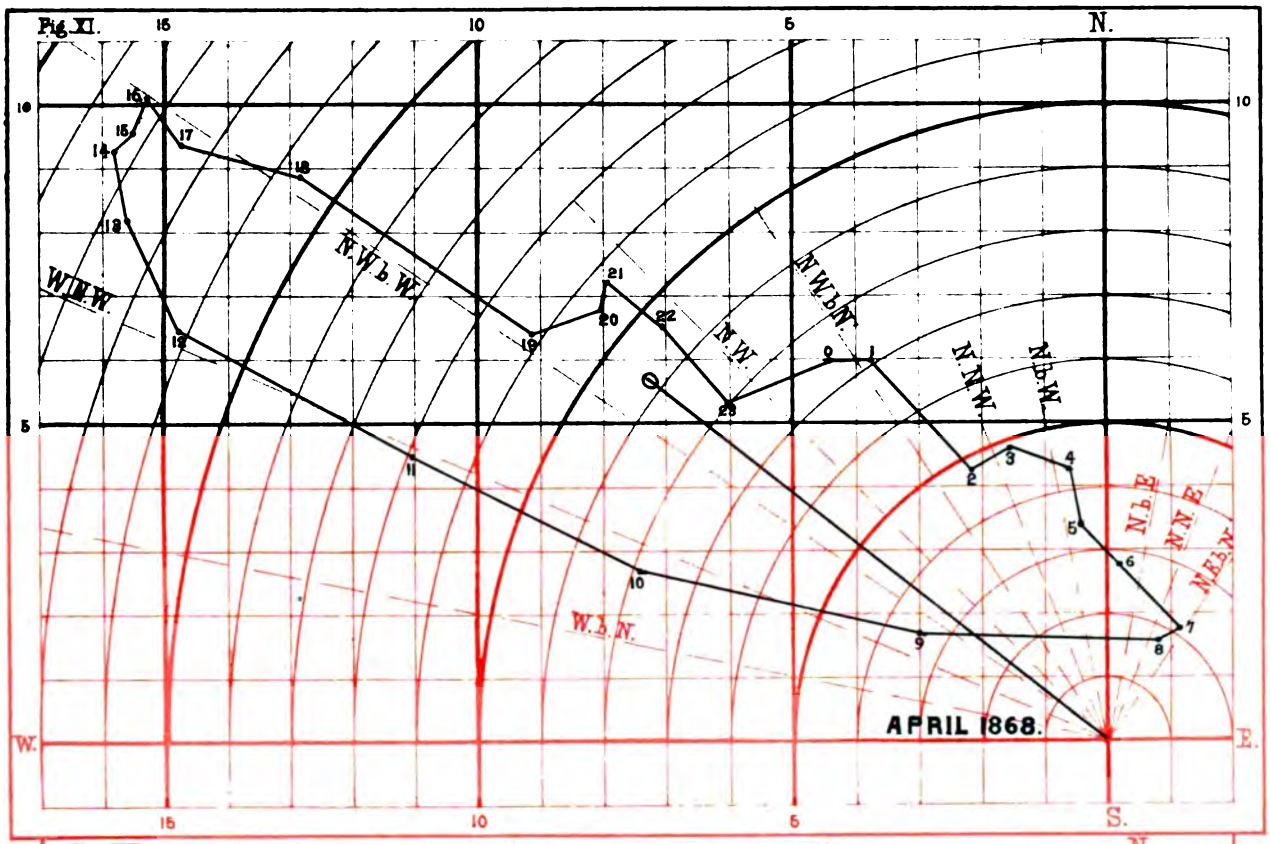
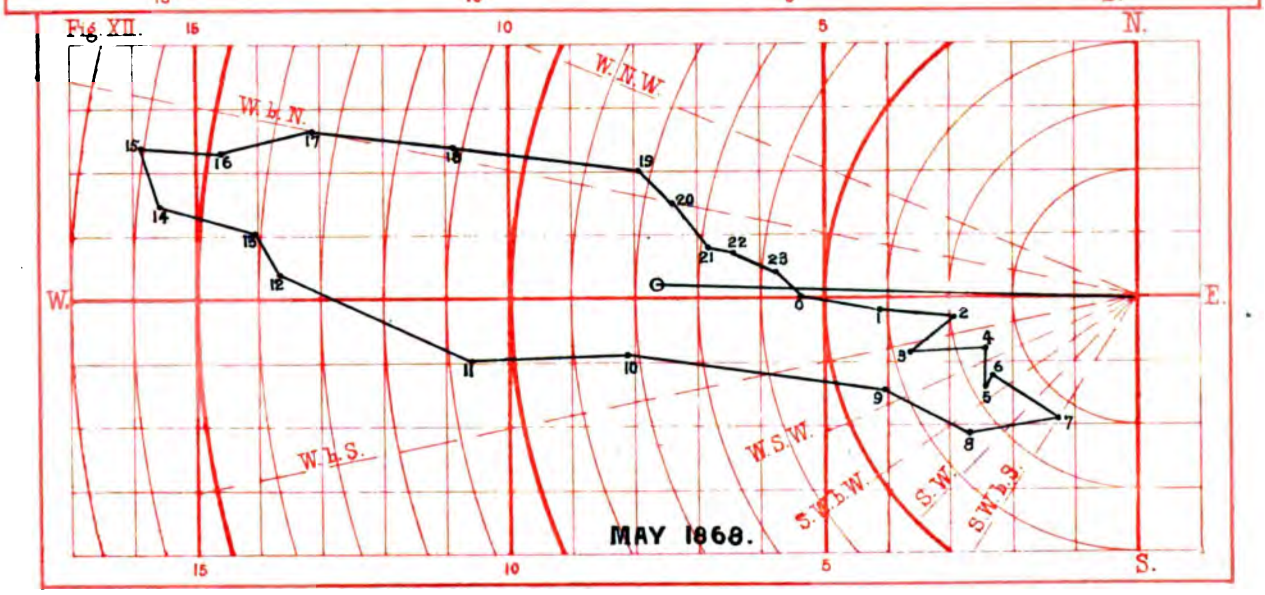


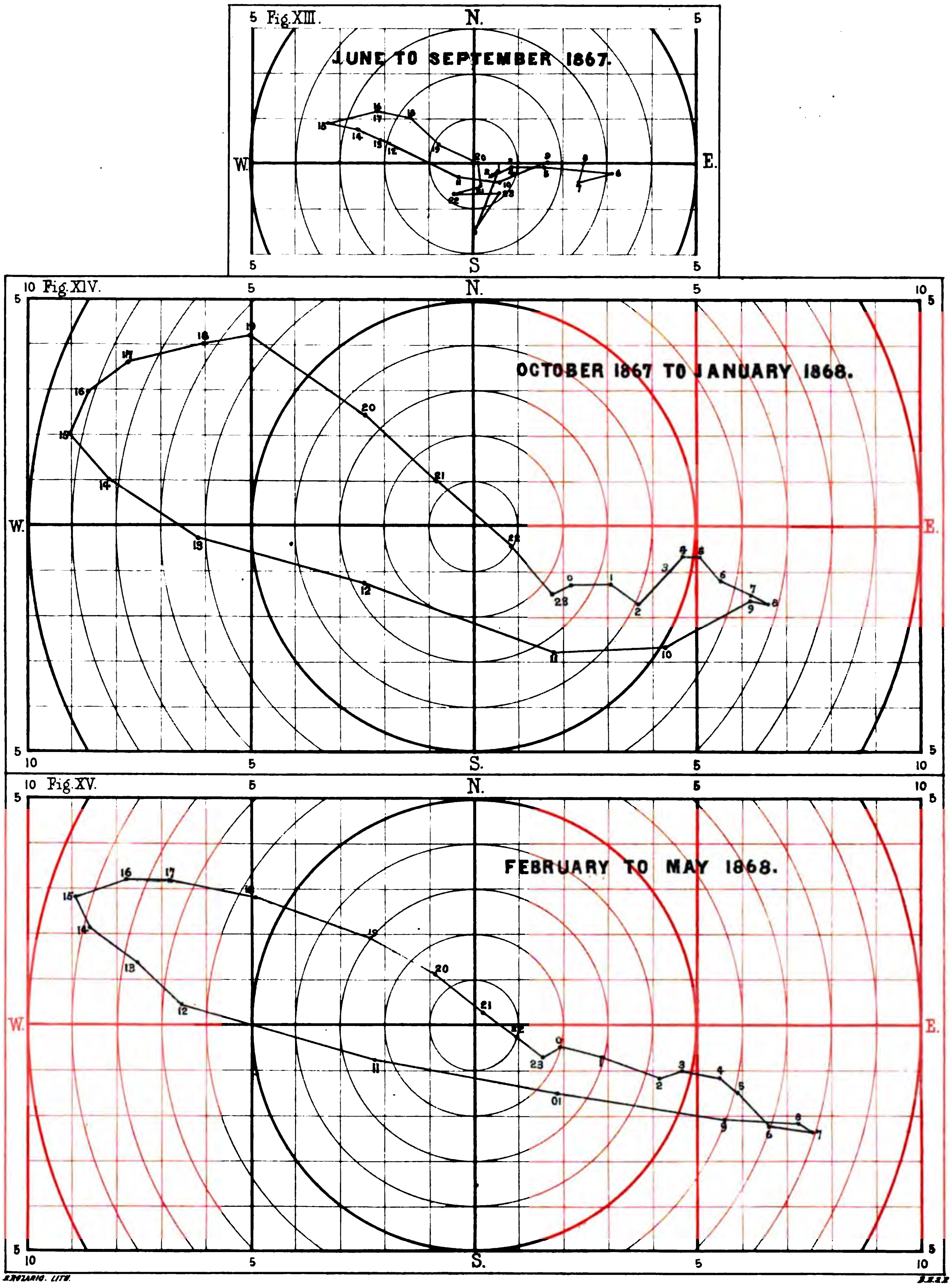
Fig. XII.



The figures placed along the course of the Curves represent, *when increased by half an hour,* the hours of the Bombay Civil Day: thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M. The numbers on the margin of each Curve-form represent miles per hour of velocity.

PLATE XXV.

CURVES showing the daily VARIATION of the mean resultant of the WINDS WHICH BLEW AT BOMBAY during the several periods June to September 1867, October 1867 to January 1868, and February to May 1868.



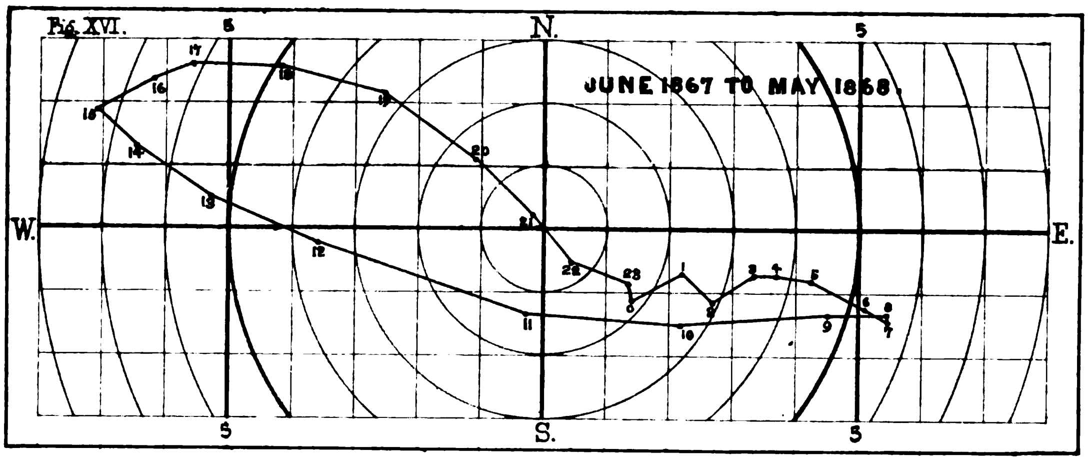
The figures placed along the course of the Curves represent, *when increased by half an hour,* the hours of the Bombay Civil Day: thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M.

The numbers on the margin of each Curve-form represent miles per hour of velocity.

PLATE XXVI.

CURVE showing the daily VARIATION of the mean resultant of the WINDS WHICH BLEW AT BOMBAY during the period June 1867 to May 1868, or one complete year,

Fig. XVI.

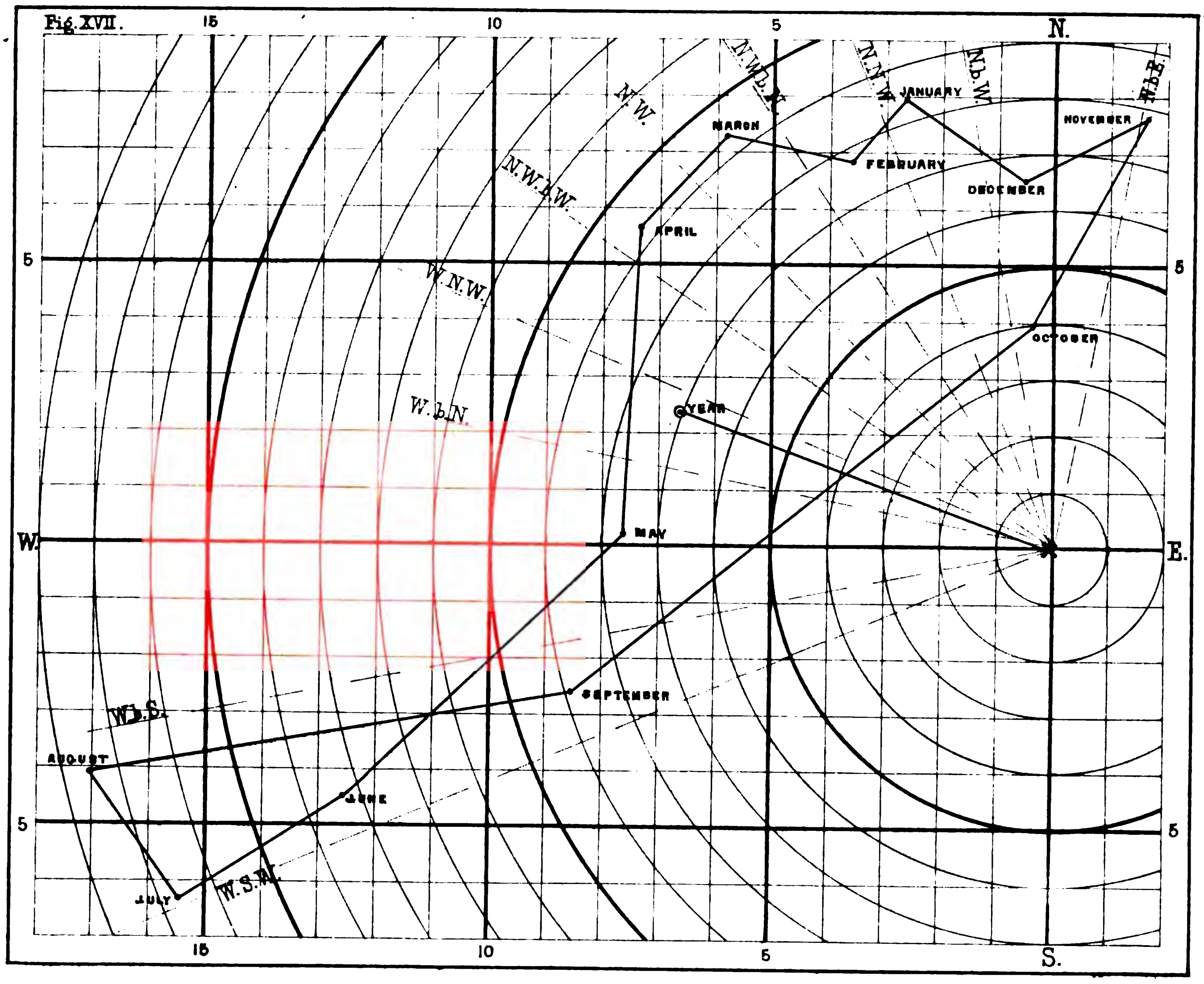


The figures placed along the course of the Curve represent, *when increased by half an hour,* the hours of the Bombay Civil Day: thus 1 indicates 1h. 30m. A.M., and 23 indicates 11h. 30m. P.M.

The numbers on the margin of the Curve-form represent miles per hour of velocity.

CURVE showing the normal DIRECTION AND VELOCITY (in miles per hour) of the WIND AT BOMBAY in each of the months from 1867 to May 1868 and in the whole year.

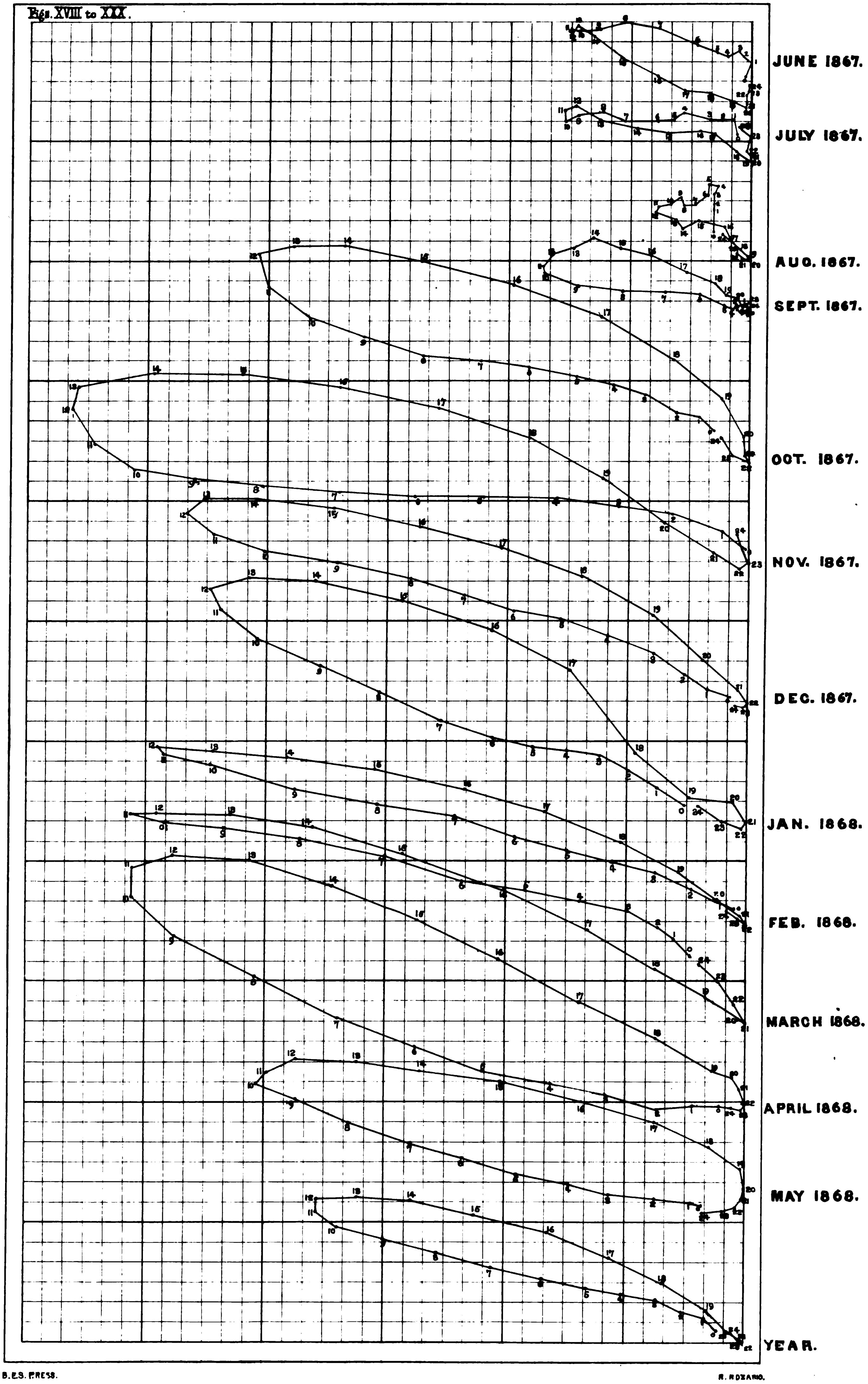
Fig. XVII.



The numbers on the margin of the Curve-form represent miles per hour of velocity.

PLATE XXVII.

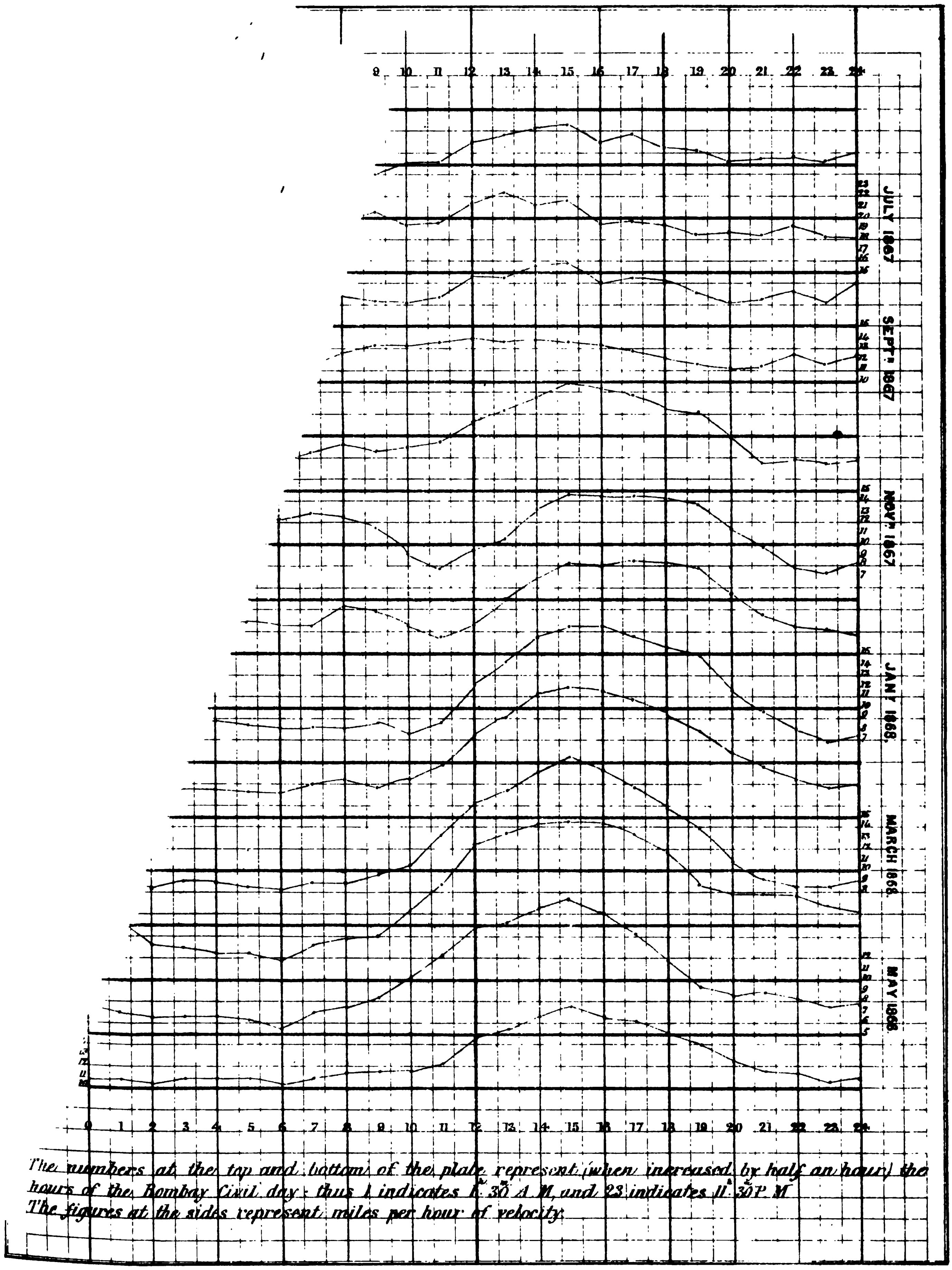
CURVES showing the relative positions at different hours of the day of the *same body of air* moving under the influence solely of the diurnal variation of the normal WIND AT BOMBAY, in each month and for the whole year.



The directions are reckoned—North, upward ; South, downward ; East, to the right ; and West, to the left.
The figures placed along the course of the Curves indicate the hours of the Bombay Civil Day.

PLATE XXVIII.

the mean VELOCITY—without regard to direction—of the WINDS WHICH BAY at each hour of the day in the months June 1867 to May 1868, and in miles per hour.



The numbers at the top and bottom of the plate represent (when increased by half an hour) the hours of the Bombay Civil day: thus 1 indicates 1.30 A.M. and 23 indicates 11.30 P.M.
The figures at the sides represent miles per hour of velocity.

ANEMOMETER CURVE.

PLATE XXIX.

From July . 13^{d}. 10^{h}. 0^{m}. to 14^{d}. 9^{h}. 55^{m}. 1868. Bombay Civil Time.

Fig. XLIV.

Movement in Miles.

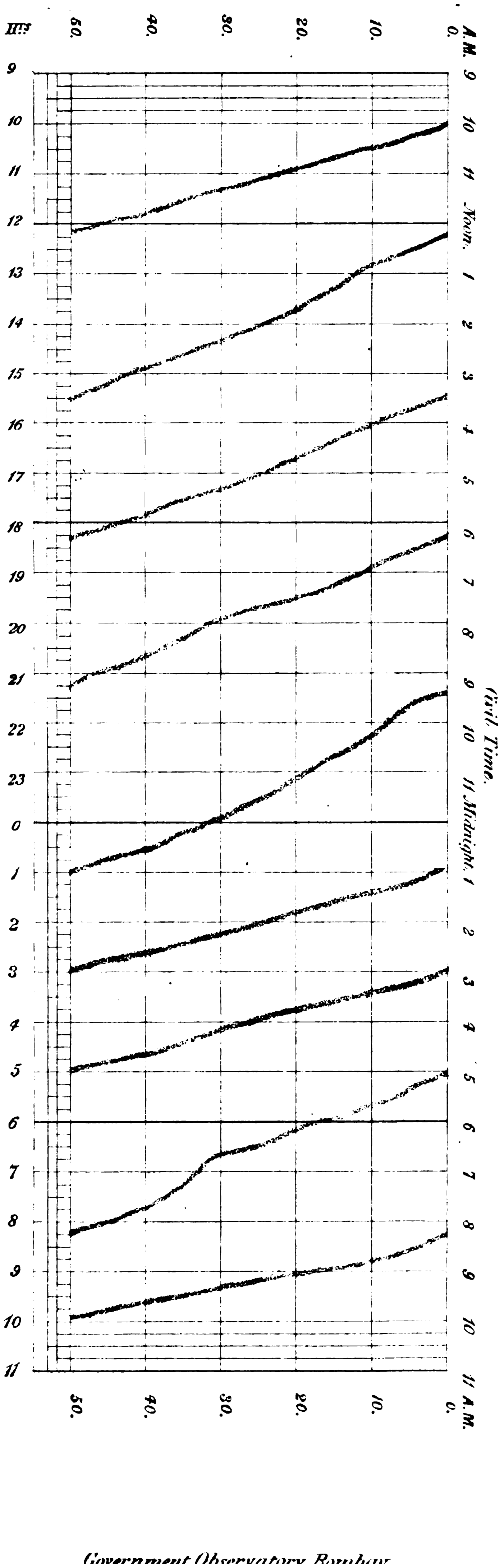
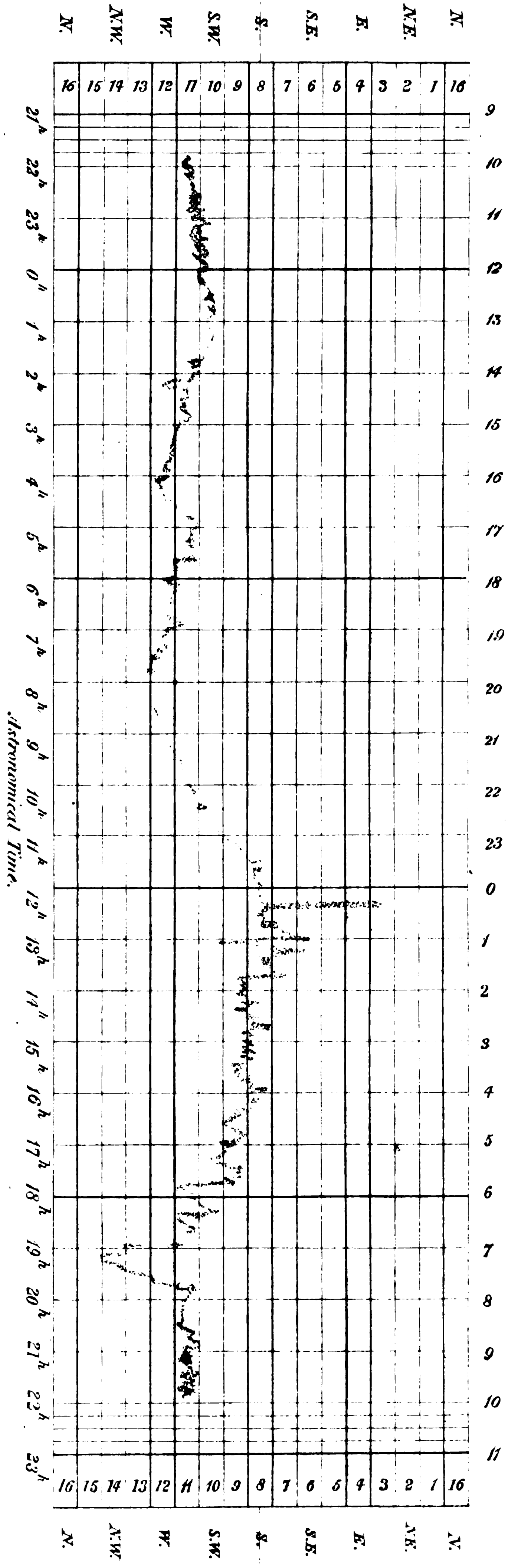


Fig. XLV.

Direction.



Government Observatory Bombay.

APPENDIX II.

ON THE SOLAR VARIATIONS OF MAGNETIC DECLINATION AT BOMBAY.

By CHARLES CHAMBERS, Esq., Superintendent of the Colaba Observatory.

Communicated by BALFOUR STEWART, *F.R.S.*[*]

Received June 30,—Read December 10, 1868.

1. The observations discussed in the following pages were made at the Government Observatory at Bombay, during the years 1859 to 1865, and constitute a portion of a much larger series of observations of which the remaining part is still awaiting reduction. With the exception of Sundays, and eight or ten complete days in each year, the observations were taken continuously at hourly intervals throughout the period of seven years. The observers were carefully trained Brahmins, who were under the immediate oversight of highly intelligent assistants of the same caste.

2. The instrument used was made by GRUBB of Dublin, and consists of a rectangular bar-magnet suspended horizontally, and carrying a divided scale and a lens, by means of which its position can be determined from time to time by reading the scale with a fixed telescope properly placed. The dimensions of the magnet are 15 inches by 0·86 inch by 0·25 inch, and the broad surface is made to lie horizontal; the suspension-thread was formed of about forty fibres of untwisted silk, and is 35 inches long, being protected (but not concealed from view) by a glass tube 1·3 inch in diameter: the bottom of the glass tube rests upon the top of a cylindrical mahogany box (8·5 inches in height) which surrounds the magnet, and the top supports a horizontal divided circle (the torsion-circle), and a brass cross piece to which the suspension-thread is attached. The tube is secured in a vertical position by a mahogany cross bar which has a circular hole in its centre that fits over the upper end of the tube, and which is fixed at its extremities to two copper pillars whose feet are screwed into the marble basement of the instrument; and the upper aperture of the tube with the attachments is screened from the outer air and dust by an inverted hemispherical glass vessel. A sliding-frame which carries above a finely divided scale etched upon glass is fixed by a binding-screw near the northern extremity of the magnet, and a similar frame carrying a lens, whose focal length is about 12·7 inches, is secured to the magnet at that distance to the southward of the glass scale, so that the latter is approximately in the principal focus of the lens. The vertical lines which form the scale are equidistant and generally of uniform length; but every fifth division is slightly and every tenth division considerably prolonged, and over the tenth divisions numbers are marked in consecutive order, thus allowing a numerical designation to be given with facility to every point of the scale when viewed by the telescope. To permit the scale to be viewed through its lens by a telescope outside the mahogany box, the latter has two small windows of flat glass suitably inserted in its curved side, and a lamp is placed on a stool to the northward of the masonry pillar which supports the declinometer, and is kept constantly burning. The joints and crevices, and, for greater security, the whole outside surface of the cylindrical box was covered with paper to keep out small spiders or other insects.

3. The observations are made by a transit instrument (30 inches long and with pivots 15 inches apart) which is fixed on an isolated pillar of masonry, at a distance of 27 feet to the southward of the declinometer pillar, and which in this position is capable of being used also for observing the transits of stars through an opening (provided with shutters) in the roof of the

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[*] Published in the "Philosophical Transactions of the Royal Society," 1869.

observatory. This instrument was adjusted in a line with the centres of the scale and lens attached to the magnet, and its basement was then firmly embedded in masonry, and the telescope was focussed so as to give a distinct view of the scale. A vertical spider-line is placed in the common principal focus of the object-glass and eye-piece, and the instrument was adjusted so that an object on the true meridian should be cut by this line. With these arrangements any change in the azimuth of the freely suspended magnet is indicated by a change of corresponding magnitude in the position of the image of the collimator scale, as seen in the field of view of the telescope; and the actual position of the magnet at any moment may be found by noting the scale-division that is cut by the reading-wire of the telescope, if only we know the position corresponding to any one reading of the scale, and the change of position for a change of unity in the reading. The latter constant, the scale-coefficient, is easily determined by substituting an azimuth instrument in the place of the transit instrument, and observing with it the horizontal angle included between any two widely different divisions of the scale when the magnet is at rest. Experiments recorded on pages x and xi of the "Introduction to the Bombay Magnetical Observations for 1864" showed that the scale was very correctly placed in the principal focus of its lens, and that the scale-coefficient is 6′·806; but the actual value of the coefficient used in the reduction of the observations was 6′·841, that having been the result of a first determination made in 1845, when the scale and lens were apparently differently adjusted with respect to each other. No correction has, however, been applied to the reduced observations for the present purpose, since the *laws of periodical variations* are exhibited with equal clearness whatever the unit with which they are expressed; and it will only be necessary to bear in mind what is the real unit made use of if we should wish to compare the variations of this element of the terrestrial magnetic force at Bombay with those of either or both of the two others, or with the results of observations made elsewhere, so that all may be reduced to a common unit as a preliminary step.*

4. The direction of the magnetic axis of the bar corresponding to a particular scale-reading was found in the following manner :—

First, the level and collimation errors of the transit instrument were approximately destroyed, and the telescope was then pointed upon *Polaris* when on the true meridian, and the azimuthal adjusting-screw turned until the star was bisected by the vertical spider-line at the proper moment, as taken from the Nautical Almanac : it appeared, from observations made in May 1866, and described in detail in the "Introduction to the Bombay Magnetical Observations for 1864," pages x to xii, that this adjustment was at that time very nearly correct. Secondly, a bundle of about forty threads of untwisted silk having been prepared with care to avoid entangling the different fibres, a brass bar of the same weight as the magnet was suspended and allowed to swing until it took up a position of rest; the arms of the torsion-circle and the attached suspension-pin, to which the upper end of this thread was bound, were then turned in azimuth until the brass bar lay at rest approximately in the true meridian: the magnet was now substituted in place of the brass bar, and a reading of the scale was taken and recorded; next, the magnet being provided with a suspension-hook that allows the bar to be inverted about its own length as an axis, without disturbing any of the attachments, this inversion was made and the scale again read. Now the position of the magnetic axis of the bar in the direct and reverse positions would be the same, but the scale-reading would be increased in the one case and diminished in the other, by an amount corresponding to the deviation of the magnetic axis from true meridian; hence the average of the two readings will give the reading that would be found if the magnet lay with its axis in the true meridian, and half their difference represents the deviation (in scale-divisions) from that position. When the instrument was last adjusted, on the 9th November, 1861, the true meridian reading was 28·2733; and the scale being placed in an inverted position it appeared erect in the telescope, so that increase of reading represents an easterly movement of the north end of the magnet.

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* It has not been deemed requisite to do this for any of the discussions that follow.

5. One other element, taking account of the magnet being restrained from responding fully to the changes of magnetic force by the torsion-force of the suspension-thread, enters into the reduction of the observations:—the torsion-force is assumed, as in COULOMB's Electrometer, to be proportional to the angle of torsion, that is, to the deviation of the magnet from the position of no torsion—in this case the *true* meridian; the torsion-coefficient, or unity, *plus* the ratio between the torsion-force and the directive force of the earth acting upon the particular magnet, is determined by observing the change of scale-reading produced when the arms of the torsion-circle are turned through 90°, dividing the corresponding angle (α) by ($90^\circ - \alpha$), and adding unity to the quotient. In November 1861 its value was found to be 1·0028, and this has been used without alteration ever since.

6. The formula used in the reduction of the observations was—

$$D = 6'\cdot841(f - R).\ c,$$

where 6'·841 is the adopted value of a unit of the declinometer scale, R the true meridian reading, c the torsion-coefficient, and D is the absolute easterly declination when f is the observed scale-reading. The values of D thus obtained, in which form the declination records have been printed in the several volumes of "Bombay Magnetical Observations," form the fundamental data for the following discussion.*

7. It ought to be mentioned that the sliding tube of the transit instrument with which the declinometer was read was rather loosely fitted in its socket, a fault which might cause sensible change in the collimation-error whenever the focussing adjustment was used; now the instrument was once every month turned upon a divided scale fixed upon the north wall of the magnetometer-room and adjusted for distinct vision, after which the adjustment was restored for the collimator scale of the magnetometer. It is suspected that small but important irregularities in the observations, which will be pointed out later, are due chiefly to this fault.

8. Throughout the periods January 1, 1859, to July 2, 1861, and November 13, 1861, to December 31, 1865, the adjustments of the instrument were undisturbed; but between July 3 and November 12, 1861, the adjustments were several times renewed, and the action of the instrument was at times so unsatisfactory that the observations of July 3 to 8, August 7 to 12, and October 28 to November 12 are considered unfit for incorporation with the general body. The following statement shows the several periods made use of, the observed and adopted values of the true meridian reading, and the values of the torsion-coefficient as experimentally determined:—

Periods.	True meridian reading.		Torsion-coefficient.
	Observed.	Adopted.	
January 1, 1859, to July 2, 1861	28·3064	28·379	1·003009
July 9, 1861, to August 6, 1861................	28·5334	31·153	1·00039
August 13, 1861, to October 27, 1861	28·2515	28·2515	1·00088
November 13, 1861, to December 31, 1865.	28·2733	28·2733	1·0028

No reason is assigned in the records for the adoption for the first two periods of a different true-meridian reading to that which was observed; but it may be presumed that in the latter case the intention was to produce that accordance, which doubtless existed in fact, between the values of declination in that and the preceding and following periods. Any periodical variations which the observations may, however, exhibit will be unaffected by the meridian reading, so long as none of the observations of any single period involved belong to more than one series, or so long as each series of observations is treated independently of the others; and it is only when combining the different series together for the elimination of secular variation and for the evaluation of absolute declination at a given epoch, that regard must be paid to the actual disconnexion of the several series. In the investigations of solar and lunar diurnal variations which follow, or are in progress, no incomplete days nor any comprising observations from different series have been made use of.

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* I should have preferred to operate directly upon the observed quantities (f), but was led to believe, at the commencement of the work, that part of the original registers had been destroyed; I have since found that this was incorrect.

9. *Method of Reduction of the Observations.*—The singularly fruitful nature of the mode of treatment of observations of a like character with those now under discussion, introduced and extensively applied by Lieut-General SABINE, P.R.S., is such as to leave no doubt as to the propriety of its adoption in the present instance, especially as the whole series of observations, the greater part of which remains still unreduced, extends over nearly a quarter of a century. That mode of treatment is described by General SABINE as follows * :—"The hourly directions of the magnet [in this case expressed in minutes of deviation of the north end of the magnet to the eastward of true north] are entered in monthly tables, having the days of the month in successive horizontal lines, and the hours of the day in vertical columns. The 'means' of the entries in each vertical column indicate the mean direction of the magnet at the different hours of the month to which the table belongs, and have received the name of 'First Normals.' On inspecting any such monthly table, it is at once seen that a considerable portion of the entries in the several columns differ considerably from their respective means or first normals, and must be regarded as 'disturbed observations.' The laws of their relative frequency and amount of disturbance, in different years, months, and hours, are then sought out, by separating for that purpose a sufficient body of the most disturbed observations, computing the amount of departure in each case from the normal of the same month and hour, and arranging the amounts in annual, monthly, and hourly tables. In making these computations, the first normals require to be themselves corrected, by the omission in each vertical column of the entries noted as disturbed, and by taking fresh means, representing the normals of each month and hour after this omission, and therefore uninfluenced by the larger disturbances. These new means have received the name of 'Final Normals,' and may be defined as being the mean directions of the magnet in every month and every hour, after the omission from the record of every entry which differed from the mean a certain amount either in excess or in defect.

"In this process there is nothing indefinite; and nothing arbitrary save the assignment of the particular amount of difference from the normal which shall be held to constitute the measure of a large disturbance, and which, for distinction sake, we may call 'the separating value.' It must be an amount which will separate a sufficient body of disturbed observations to permit their laws to be satisfactorily ascertained; but in other respects its precise value is of minor significancy; and the limits within which a selection may be made, without materially affecting the results, are usually by no means narrow; for it has been found experimentally on several occasions that the ratios by which the periodical variations of disturbance in different years, months, and hours are characterized and expressed do not undergo any material change by even considerable differences in the amount of the separating value. The separating value must necessarily be larger at some stations than at others, because the absolute magnitude of the disturbance-variation itself is very different in different parts of the globe, as well as its comparative magnitude in relation to the more regular solar-diurnal variation; but it must be a constant quantity throughout at one and the same station, or it will not truly show the relative proportion of disturbance in different years and different months."

In two instances only were days of a certain month included, in consequence of interruption of the observations, in the monthly Tables of a different month, viz. :—the 1st and 2nd of

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* Proceedings of the Royal Society, vol. x. pp. 624—626.

July with the month of June 1861, and from the 1st to the 6th of August with the month of July 1861; and the only incomplete months were those of August, October, and November 1861. The first step to be taken was to fix upon a suitable *separating value*, and in doing this regard was paid to the desirableness of having the results derived for Bombay comparable with those for some one of the stations where similar observations had been made and similarly treated. Now the ordinary reductions of the Bombay observations already made showed that the station amongst those which it most nearly resembled was St. Helena; for whilst both are equatorial stations in the sense of the ordinary solar-diurnal variation being at certain seasons over-ridden by the semi-annual inequality of that variation, Bombay has very nearly the same preponderance of the character of a north-latitude station that St. Helena has as a south-latitude station. The separating value adopted by General Sabine in the reduction of the St. Helena observations was 1′·78, or a disturbing force equal to ·0029 English units; a force of this magnitude acting at Bombay would produce a deviation of the declination-magnet of 1′·25. The value finally fixed upon was 1′·4, which gives the ratio of the number (3516) of disturbed observations to the total number (50736) of observations in the seven years as 1 to 14·4, the similar ratio for St. Helena having been 1 to 13·7.

10. Trials were also made with separating values 1′·0 for the years 1859 and 1860, and 1′·7 for 1860, the results of which (being further confirmatory of the position taken above that "the *ratios* by which the periodical variations of disturbance in different hours are characterized and expressed, do not undergo any material change by even considerable differences in the amount of the separating value") are shown in the subjoined Tables, and by Curves Nos. 1 to 4 of Plate XXX.

TABLE I.—Showing, for each hour of the day, the aggregates of Easterly disturbances of Declination exceeding 1′·0, 1′·4, and 1′·7 respectively, in the years 1859 and 1860, and the corresponding ratios of the aggregate disturbance at each hour to the average aggregate hourly disturbance for the twenty-four hours.

Bombay Astronomical Hours.	Aggregates of Easterly Disturbances.					Ratios.				
	1859.		1860.			1859.		1860.		
	Separating value.					Separating value.				
	1′·0.	1′·4.	1′·0.	1′·4.	1′·7.	1′·0.	1′·4.	1′·0.	1′·4.	1′·7.
h. m.										
4 12	51·757	35·466	46·246	29·107	18·025	0·90	0·88	0·90	0·83	0·70
5 12	51·593	29·690	42·672	19·311	13·192	0·90	0·74	0·83	0·56	0·52
6 12	43·782	28·741	31·687	22·608	19·348	0·76	0·71	0·61	0·65	0·76
7 12	48·294	34·288	35·280	35·102	30·890	0·84	0·85	0·68	1·01	1·21
8 12	61·750	43·332	37·917	29·834	21·345	1·08	1·07	0·73	0·86	0·83
9 12	50·127	31·550	39·530	26·678	23·296	0·88	0·78	0·76	0·77	0·91
10 12	59·087	41·861	40·473	23·614	15·830	1·03	1·04	0·78	0·68	0·62
11 12	47·550	40·412	42·193	21·482	12·942	0·83	1·00	0·82	0·62	0·51
12 12	44·935	36·934	25·639	22·429	8·458	0·78	0·91	0·50	0·65	0·33
13 12	41·108	31·866	36·812	18·459	14·828	0·72	0·79	0·71	0·53	0·58
14 12	36·100	29·017	28·555	16·674	11·715	0·63	0·72	0·55	0·48	0·46
15 12	32·732	25·540	36·595	25·299	17·069	0·57	0·63	0·71	0·73	0·67
16 12	32·534	22·446	40·806	17·891	13·079	0·57	0·56	0·79	0·52	0·51
17 12	37·221	22·906	51·522	31·804	28·145	0·65	0·57	1·00	0·92	1·10
18 12	53·392	37·587	77·986	60·232	51·330	0·93	0·93	1·51	1·74	2·01
19 12	68·025	59·644	83·650	61·639	47·653	1·19	1·48	1·62	1·78	1·86
20 12	84·294	43·181	61·085	40·580	31·984	1·47	1·07	1·18	1·17	1·25
21 12	82·185	49·738	71·760	31·803	19·012	1·44	1·23	1·39	0·92	0·74
22 12	116·645	71·755	63·296	49·933	38·281	2·04	1·78	1·23	1·44	1·50
23 12	101·169	90·538	82·663	56·567	29·285	1·77	2·24	1·60	1·63	1·14
0 12	74·977	57·241	65·006	51·857	41·839	1·31	1·42	1·26	1·50	1·64
1 12	55·486	45·681	69·136	57·587	41·671	0·97	1·13	1·34	1·66	1·63
2 12	42·152	30·646	78·016	40·832	38·878	0·74	0·76	1·51	1·18	1·52
3 12	56·927	29·154	49·720	40·975	25·997	0·99	0·72	0·96	1·18	1·02

TABLE II.—Showing, for each hour of the day, the aggregates of Westerly disturbances of Declination exceeding 1′·0, 1′·4, and 1′·7 respectively, in the years 1859 and 1860, and the corresponding ratios of the aggregate disturbance at each hour to the average aggregate hourly disturbance for the twenty-four hours.

Bombay Astronomical Hours.	Aggregates of Westerly Disturbance.					Ratios.				
	1859.		1860.			1859.		1860.		
	Separating value.					Separating value.				
	1′·0.	1′·4.	1′·0.	1′·4.	1′·7.	1′·0.	1′·4.	1′·0.	1′·4.	1′·7.
h. m.										
4 12	24·787	15·013	50·816	32·064	26·760	0·71	0·72	1·27	1·27	1·49
5 12	10·189	7·905	26·883	19·412	16·416	0·29	0·38	0·67	0·77	0·91
6 12	10·201	4·717	17·461	8·013	8·013	0·29	0·23	0·44	0·32	0·45
7 12	6·486	3·263	10·855	10·143	0·000	0·19	0·16	0·27	0·40	0·00
8 12	1·011	0·000	9·468	1·609	0·000	0·03	0·00	0·24	0·06	0·00
9 12	3·310	0·000	7·202	3·117	0·000	0·07	0·00	0·18	0·12	0·00
10 12	1·395	0·000	7·959	6·438	0·000	0·04	0·00	0·20	0·25	0·00
11 12	3·237	2·024	8·552	1·569	0·000	0·09	0·10	0·21	0·06	0·00
12 12	1·887	1·896	14·075	0·000	0·000	0·05	0·09	0·35	0·00	0·00
13 12	0·000	0·000	7·433	3·114	0·000	0·00	9·00	0·19	0·12	0·00
14 12	2·198	0·000	10·457	5·461	2·159	0·06	0·00	0·26	0·22	0·12
15 12	3·535	0·000	11·472	6·754	2·025	0·10	0·00	0·29	0·27	0·11
16 12	4·749	0·000	10·787	2·011	2·156	0·14	0·00	0·27	0·08	0·12
17 12	7·771	2·881	21·923	11·698	4·078	0·22	0·14	0·55	0·46	0·23
18 12	44·972	25·868	33·496	7·822	9·742	1·30	1·24	0·84	0·31	0·54
19 12	48·941	13·587	51·874	25·168	16·693	1·41	0·65	1·29	1·00	0·93
20 12	41·231	23·262	64·509	40·914	18·695	1·19	1·11	1·61	1·62	1·04
21 12	73·392	51·357	78·574	69·518	61·456	2·12	2·46	1·96	2·75	3·42
22 12	65·552	53·587	119·854	78·239	65·378	1·89	2·57	2·99	3·09	3·64
23 12	125·160	71·600	97·152	68·135	65·226	3·61	3·43	2·40	2·70	3·63
0 12	109·060	83·193	102·258	69·272	52·325	3·15	3·99	2·55	2·74	2·91
1 12	113·927	75·811	84·736	60·539	33·296	3·29	3·63	2·11	2·39	1·85
2 12	90·291	47·939	58·058	46·296	22·661	2·60	2·30	1·45	1·83	1·26
3 12	39·807	16·962	55·962	29·424	24·285	1·15	0·81	1·40	1·16	1·35

The number of observations reckoned as disturbed with the different separating values was as follows :—

TABLE III.

	Number of disturbed observations.			Number of observations out of which on an average one is disturbed.		
Separating value	1′·0	1′·4	1′·7	1′·0	1′·4	1′·7
1859	1259	672	...	5·8	10·9	...
1860	1318	685	434	5·6	10·7	16·9

Disturbance-variations, Diurnal, Annual, and Decennial.—The following Tables exhibit the general results as to diurnal, annual, and decennial variations of disturbance when the separating value made use of is 1′·4.

TABLE IV.—Showing the aggregates of Easterly disturbances exceeding 1′·4 in amount for each hour of the day in each of the years 1859 to 1865, and in the whole period of seven years; also for the whole period, the ratios of aggregate disturbance at the several hours to the average aggregate hourly disturbance in the twenty-four hours.

Bombay Astronomical Hours.	Aggregates of Easterly Disturbance.								Ratios.
	1859.	1860.	1861.	1862.	1863.	1864.	1865.	Seven years, 1859 to 1865.	
h m									
4 12	35·466	29·107	17·153	33·364	22·841	10·058	22·777	170·766	0·94
5 12	29·690	19·311	7·649	48·925	16·214	17·529	15·789	155·107	0·86
6 12	28·741	22·608	6·637	26·097	23·345	18·817	25·042	151·287	0·84
7 12	34·288	35·102	13·825	20·864	18·871	5·743	13·132	141·825	0·78
8 12	43·332	29·834	20·293	30·670	19·230	8·054	16·396	167·809	0·93
9 12	31·550	26·678	14·459	19·417	7·742	10·225	19·112	129·183	0·71
10 12	41·861	23·614	16·697	14·826	3·987	4·817	11·363	117·165	0·65
11 12	40·412	21·482	21·490	23·522	6·162	3·819	5·607	122·494	0·68
12 12	36·934	22·429	26·900	21·564	0·000	5·079	9·773	122·679	0·68
13 12	31·866	18·459	25·131	14·455	8·746	7·880	13·594	120·131	0·66
14 12	29·017	16·674	13·612	21·417	7·993	9·229	14·274	112·216	0·62
15 12	25·540	25·299	22·647	28·693	12·297	16·307	20·598	151·381	0·84
16 12	22·446	17·891	20·821	13·856	10·591	14·974	16·375	116·954	0·65
17 12	22·906	31·804	13·247	15·917	6·514	15·691	8·254	114·333	0·63
18 12	37·587	60·232	18·583	19·855	3·238	9·840	14·236	163·571	0·90
19 12	59·644	61·639	27·029	26·175	14·956	13·030	13·250	215·723	1·19
20 12	43·181	40·580	27·107	27·248	9·460	12·929	5·265	165·770	0·92
21 12	49·738	31·803	32·626	45·258	12·444	13·964	19·449	205·282	1·14
22 12	71·755	49·933	32·302	71·258	18·259	30·885	30·277	304·669	1·69
23 12	90·538	56·567	38·052	68·850	33·287	24·832	29·167	341·293	1·89
0 12	57·241	51·857	27·281	63·044	63·427	32·828	29·614	325·292	1·80
1 12	45·681	57·587	26·204	58·423	45·320	30·713	25·231	289·159	1·60
2 12	30·646	40·832	22·609	44·571	34·410	36·667	34·197	243·932	1·35
3 12	29·154	40·975	21·219	32·459	17·198	20·459	29·100	190·564	1·05

The hourly ratios are also represented, in the usual manner, by curve No. 5, Plate XXX.

TABLE V.—Showing the aggregates of Westerly disturbances exceeding 1′·4 in amount for each hour of the day in each of the years 1859 to 1865, and in the whole period of seven years; also, for the whole period, the ratios of aggregate disturbance at the several hours to the average aggregate hourly disturbance in the twenty-four hours.

Bombay Astronomical hours.	Aggregates of Westerly Disturbance.								Ratios.
	1859.	1860.	1861.	1862.	1863.	1864.	1865.	Seven years, 1859 to 1865.	
h m									
4 12	15·013	32·064	14·454	32·204	6·893	11·174	9·100	120·902	1·08
5 12	7·905	19·412	9·513	12·966	1·418	9·040	8·438	68·692	0·61
6 12	4·717	8·013	6·502	11·999	1·404	2·512	9·008	44·155	0·39
7 12	3·263	10·143	5·509	17·113	0·000	3·768	7·906	47·702	0·43
8 12	0·000	1·609	1·733	8·432	3·140	0·000	5·486	20·400	0·18
9 12	0·000	3·117	0·000	7·209	1·504	0·000	2·908	14·738	0·13
10 12	0·000	6·438	0·000	6·841	1·472	0·000	3·568	18·319	0·16
11 12	2·024	1·569	0·000	1·655	1·518	0·000	1·561	8·327	0·07
12 12	1·896	0·000	0·000	3·661	0·000	0·000	0·000	5·557	0·05
13 12	0·000	3·114	1·550	6·526	0·000	0·000	4·854	16·044	0·14
14 12	0·000	5·461	2·137	6·513	1·655	0·000	0·000	15·766	0·14
15 12	0·000	6·754	0·000	6·413	0·000	0·000	1·710	14·877	0·13
16 12	0·000	2·011	1·464	4·880	3·653	0·000	6·662	18·670	0·17
17 12	2·881	11·698	0·000	6·891	5·446	1·567	13·378	41·861	0·37
18 12	25·868	7·822	6·827	23·963	3·607	4·765	13·781	86·635	0·77
19 12	13·587	25·168	21·578	18·685	9·431	8·544	16·417	113·410	1·01
20 12	23·262	40·914	23·882	33·729	31·408	15·059	17·349	185·603	1·66
21 12	51·357	69·518	25·055	43·036	32·460	28·909	15·863	266·198	2·37
22 12	53·587	78·239	48·552	41·718	37·928	27·151	26·749	313·924	2·80
23 12	71·600	68·135	37·509	37·271	41·551	28·587	25·384	310·037	2·76
0 12	83·193	69·272	49·884	42·012	20·564	17·270	26·744	308·939	2·75
1 12	75·811	60·539	46·012	41·489	26·947	21·303	11·828	283·929	2·53
2 12	47·939	46·296	22·632	33·045	34·339	12·880	15·951	213·082	1·90
3 12	16·962	29·424	23·511	37·265	15·289	21·635	9·483	153·569	1·37

The hourly ratios are also represented, in the usual manner, by curve No. 6, Plate XXX.

TABLE VI.—Showing, for the period 1859 to 1865, the algebraical sum of all disturbances, those to the Eastward being reckoned as positive, those to the Westward as negative, exceeding 1′·4 in amount for each hour of the day.

	Bombay Astronomical Hours.											
	h m 4 12	h m 5 12	h m 6 12	h m 7 12	h m 8 12	h m 9 12	h m 10 12	h m 11 12	h m 12 12	h m 13 12	h m 14 12	h m 15 12
Excess of Easterly Disturbances.	+49·864	+86·415	+107·132	+94·123	+147·409	+114·445	+98·846	+114·167	+117·122	+104·087	+96·450	+136·504
	Bombay Astronomical Hours.											
	h m 16 12	h m 17 12	h m 18 12	h m 19 12	h m 20 12	h m 21 12	h m 22 12	h m 23 12	h m 0 12	h m 1 12	h m 2 12	h m 3 12
Excess of Easterly Disturbances.	+98·284	+72·472	+76·936	+102·313	−19·833	−60·916	−9·255	+31·256	+16·353	+5·230	+30·850	+36·995

The curve which represents the disturbance diurnal variation, constructed from these numbers, is marked fig. 7 on Plate XXX.

TABLE VII.—Showing, for the period 1859 to 1865, the aggregates of Easterly and of Westerly disturbance in each month of the year, the corresponding ratios to the average aggregate monthly disturbance, and the numbers of observations separated as disturbed in each month.

Months.	Easterly Disturbances.			Westerly Disturbances.			Easterly and Westerly Disturbances.		
	Aggregates.	Ratios.	Numbers of disturbed observations.	Aggregates.	Ratios.	Numbers of disturbed observations.	Aggregates.	Ratios.	Numbers of disturbed observations.
January	304′·347	0·84	155	198′·089	0·88	105	502′·436	0·86	260
February	323·306	0·89	165	150·901	0·67	79	474·207	0·81	244
March	465·344	1·29	225	209·485	0·93	114	674·829	1·15	339
April	376·052	1·04	185	289·836	1·29	153	665·888	1·14	338
May	207·107	0·57	110	224·211	1·00	117	431·318	0·74	227
June	264·433	0·73	136	183·258	0·82	96	447·691	0·76	232
July	428·079	1·18	211	409·885	1·83	204	837·964	1·43	415
August	592·799	1·64	270	288·258	1·29	155	881·057	1·50	425
September	434·502	1·20	195	234·283	1·04	127	668·785	1·14	322
October	551·198	1·52	245	293·979	1·31	151	845·177	1·44	396
November	144·255	0·40	76	91·034	0·41	51	235·289	0·40	127
December	247·163	0·68	126	118·117	0·53	65	365·280	0·62	191

TABLE VIII.—Showing the aggregates of Easterly and of Westerly disturbance in each of the years 1859 to 1865, and in the whole seven years, and the ratios of the aggregates for the individual years to the average annual aggregate; also the numbers of observations separated as disturbed in each year and in the whole period.

Years.	Easterly Disturbances.			Westerly Disturbances.			Easterly and Westerly Disturbances.		
	Aggregates.	Ratios.	Numbers of disturbed observations.	Aggregates.	Ratios.	Numbers of disturbed observations.	Aggregates.	Ratios.	Numbers of disturbed observations.
1859.	969′·214	1·56	417	500′·865	1·30	255	1470′·079	1·46	672
1860.	832·297	1·34	385	606·730	1·58	300	1439·027	1·43	685
1861*.	513·573	0·83	262	348·304	0·91	189	861·877	0·86	451
1862.	790·728	1·28	388	485·518	1·26	262	1276·246	1·27	650
1863.	416·532	0·67	217	281·627	0·73	157	698·159	0·70	374
1864.	374·369	0·60	198	214·164	0·56	120	588·533	0·59	318
1865.	441·872	0·71	232	254·128	0·66	134	696·000	0·69	366
Seven years.	4338·585	……	2099	2691·336	……	1417	7029·921	……	3516

* The deficiency in the ratios and numbers of observations for the year 1861 is partly accounted for by the fact that during an aggregate of thirty-one days in the months of July, August, October, and November the instrument was acting irregularly or was under adjustment, and the observations had to be rejected.

12. *Remarks on the Disturbance-variations.*—At nearly all stations whose disturbance-diurnal variation curves have been found by the process described above, one or other of these curves, either the easterly or the westerly, closely corresponds in shape to a general type. The westerly disturbance-diurnal variation curve for Bombay conforms to this type, of which the characteristics are, that during about half the day the ordinates are very small, whilst there is a gradual and regular rise on either side of this quiescent period towards a maximum, which occurs near the middle of the remaining part of the day; such curves are the easterly for Kew, St. Helena, Toronto, and the Cape of Good Hope, and the westerly for Hobarton, St. Helena, Pekin, and Nertschinsk. The correspondence as to shape does not, however, hold as to time, either absolute or local, for the hours of maxima are not confined to any particular portion of the day. The Bombay astronomical hours of little or no westerly disturbance are from 6 to 17, the considerable and regular variation from hour to hour occurring during the remaining hours. The principal features of the easterly disturbance-diurnal variation curve for Bombay are like those of the westerly curve, with this distinction, that there is a considerable amount of easterly disturbance at all hours of the day, the least hourly ratio being 0·62; the easterly curve is also less remarkably regular than the westerly. There is great similarity in the declination-disturbance-diurnal variations of St. Helena and Bombay, and the principal inflections of the curves occur at the same local hours; but the night hours at St. Helena are unlike the same at Bombay, almost entirely free from easterly disturbance. In the disturbance-annual variations there is, as at Toronto, a tendency, though not very decided, towards maxima at the equinoxes and minima at the solstices. Having regard to the note at foot of Table VIII., it is seen that the decennial variation of aggregate disturbance is distinctly indicated, as far as seven years are capable of showing it, both in the easterly, westerly, and combined disturbances, the minimum occurring in 1864 and the maximum about the end of 1859. The aggregate of disturbances in the latter year exceeds that in the former in the proportion of 2·5 to 1. The disturbance diurnal variation curve shows a preponderance of easterly disturbance at all hours except 20^h and 21^h; from 5^h to 19^h the preponderance is great, but is less considerable during the remaining hours: on the whole the proportion of aggregate easterly disturbance to westerly is as 1·6 to 1.

13. *The regular Solar-diurnal Variation.*—After the separation of disturbed observations differing from the final normals by 1'·4, the averages were taken of the monthly final normals of each hour—in the first place for every month, and in the second place for each of the fourteen half years; and by means of these averages were calculated the diurnal variations* for each month (on an average of seven years) for the whole year, and for each individual half year from 1859 to 1865, the one half year comprising the months April to September, and the other the months January to March and October to December. The diurnal variations are shown in the following Tables.

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* By diurnal or annual variations is always to be understood the series of hourly or monthly values expressed by the excess of each above the mean value for the whole day or for the whole year respectively.

TABLE IX.—Showing, for the period 1859 to 1865, the mean diurnal variation of Declination for each month of the year and for the whole year.*

Bombay Astronomical Hours.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
h m													
0 12	−0·554	−0·460	−1·217	−2·226	−2·536	−2·424	−1·969	−2·849	−2·937	−1·382	−0·256	−0·213	−1·585
1 12	−0·183	−0·421	−1·389	−2·182	−2·099	−2·428	−2·172	−2·574	−2·588	−1·090	+0·244	+0·225	−1·388
2 12	+0·003	−0·183	−0·639	−1·610	−1·599	−2·067	−1·860	−1·881	−1·416	−0·266	+0·427	+0·342	−0·896
3 12	+0·136	−0·072	−0·153	−0·704	−0·751	−1·279	−1·097	−0·847	−0·183	+0·311	+0·280	+0·321	−0·337
4 12	+0·210	+0·066	+0·146	−0·065	−0·088	−0·395	−0·372	+0·021	+0·508	+0·412	+0·136	+0·280	+0·072
5 12	−0·019	−0·130	−0·261	−0·024	+0·184	−0·017	+0·004	+0·417	+0·266	−0·157	−0·125	+0·040	+0·015
6 12	+0·005	−0·289	−0·508	−0·267	+0·065	−0·038	−0·030	+0·225	−0·110	−0·268	−0·026	+0·069	−0·098
7 12	+0·169	+0·012	−0·301	−0·323	−0·333	−0·385	−0·407	−0·200	−0·092	−0·073	+0·163	+0·269	−0·125
8 12	+0·168	+0·098	−0·201	−0·253	−0·402	−0·395	−0·594	−0·210	−0·064	−0·057	+0·212	+0·220	−0·123
9 12	+0·155	+0·067	−0·082	−0·052	−0·223	−0·298	−0·401	−0·163	−0·033	−0·064	+0·173	+0·211	−0·059
10 12	+0·131	+0·056	−0·081	+0·084	−0·077	−0·173	−0·240	−0·098	+0·020	+0·074	+0·238	+0·209	+0·012
11 12	+0·164	+0·113	+0·090	+0·203	+0·034	+0·028	−0·082	+0·055	+0·099	+0·144	+0·334	+0·239	+0·118
12 12	+0·107	+0·175	+0·149	+0·302	+0·151	+0·236	+0·073	+0·147	+0·190	+0·183	+0·282	+0·223	+0·185
13 12	+0·051	+0·176	+0·166	+0·414	+0·276	+0·366	+0·256	+0·249	+0·291	+0·218	+0·218	+0·161	+0·237
14 12	−0·115	+0·130	+0·109	+0·453	+0·341	+0·460	+0·346	+0·307	+0·302	+0·113	+0·111	+0·026	+0·215
15 12	−0·224	−0·014	−0·037	+0·267	+0·293	+0·477	+0·368	+0·358	+0·294	+0·019	−0·033	+0·092	+0·155
16 12	−0·400	−0·230	−0·136	+0·116	+0·326	+0·478	+0·435	+0·420	+0·312	−0·080	−0·251	−0·173	+0·068
17 12	−0·443	−0·330	−0·155	+0·162	+0·630	+0·870	+0·850	+0·882	+0·533	−0·150	−0·502	−0·465	+0·157
18 12	−0·551	−0·367	+0·007	+0·974	+1·873	+2·080	+2·064	+2·068	+1·582	+0·218	−0·608	−0·687	+0·721
19 12	−0·648	−0·249	+0·693	+1·962	+2·641	+2·708	+2·544	+2·937	+2·494	+0·898	−0·705	−0·971	+1·192
20 12	+0·066	+0·409	+1·486	+2·242	+2·426	+2·507	+2·344	+2·586	+2·310	+1·338	−0·178	−0·445	+1·424
21 12	+0·978	+0·840	+1·582	+1·532	+1·136	+1·455	+1·272	+0·996	+1·009	+0·904	+0·199	+0·172	+1·006
22 12	+1·055	+0·660	+1·012	+0·188	−0·501	−0·216	−0·020	−0·742	−0·713	−0·081	+0·048	+0·119	+0·067
23 12	−0·264	−0·053	−0·280	−1·194	−1·778	−1·537	−1·326	−2·104	−2·080	−1·176	−0·376	−0·277	−1·037

The variation for the year is also represented by curve No. 8, Plate XXX.

TABLE X.—Showing, for the period 1859 to 1865, the excess of the mean diurnal variation of Declination for each month over the mean diurnal variation for the year.

Bombay Astronomical Hours.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
h m												
0 12	+1·031	+1·125	+0·368	−0·641	−0·951	−0·839	−0·384	−1·264	−1·352	+0·203	+1·329	+1·372
1 12	+1·205	+0·967	−0·001	−0·794	−0·711	−1·040	−0·784	−1·186	−1·200	+0·298	+1·632	+1·613
2 12	+0·899	+0·713	+0·257	−0·714	−0·703	−1·171	−0·964	−0·985	−0·520	+0·630	+1·323	+1·238
3 12	+0·473	+0·265	+0·184	−0·367	−0·414	−0·942	−0·760	−0·510	+0·154	+0·648	+0·617	+0·658
4 12	+0·138	−0·006	+0·074	−0·137	−0·160	−0·467	−0·444	−0·051	+0·436	+0·340	+0·064	+0·298
5 12	−0·034	−0·145	−0·276	−0·039	+0·169	−0·032	−0·011	+0·402	+0·251	−0·172	−0·140	+0·025
6 12	+0·103	−0·191	−0·410	−0·169	+0·163	+0·060	+0·068	+0·323	−0·012	−0·170	+0·072	+0·167
7 12	+0·294	+0·137	−0·176	−0·198	−0·208	−0·260	−0·282	−0·075	+0·033	+0·052	+0·288	+0·394
8 12	+0·291	+0·221	−0·078	−0·130	−0·279	−0·272	−0·471	−0·087	+0·059	+0·066	+0·335	+0·343
9 12	+0·214	+0·126	−0·023	+0·007	−0·164	−0·139	−0·342	−0·104	+0·026	−0·005	+0·232	+0·270
10 12	+0·119	+0·044	−0·093	+0·072	−0·089	−0·185	−0·252	−0·110	+0·008	+0·062	+0·226	+0·197
11 12	+0·046	−0·005	−0·028	+0·085	−0·084	−0·090	−0·200	−0·063	−0·019	+0·026	+0·216	+0·121
12 12	−0·078	−0·010	−0·036	+0·117	−0·034	+0·051	−0·112	−0·038	+0·005	−0·002	+0·097	+0·038
13 12	−0·186	−0·061	−0·071	+0·177	+0·039	+0·129	+0·019	+0·012	+0·054	−0·019	−0·019	−0·076
14 12	−0·330	−0·085	−0·106	+0·238	+0·126	+0·245	+0·131	+0·092	+0·087	−0·102	−0·104	−0·189
15 12	−0·379	−0·169	−0·192	+0·112	+0·138	+0·322	+0·213	+0·203	+0·139	−0·136	−0·122	−0·063
16 12	−0·468	−0·298	−0·204	+0·048	+0·258	+0·410	+0·367	+0·352	+0·244	−0·148	−0·319	−0·241
17 12	−0·600	−0·487	−0·312	+0·005	+0·473	+0·713	+0·693	+0·725	+0·376	−0·307	−0·659	−0·622
18 12	−1·272	−1·088	−0·714	+0·253	+1·152	+1·359	+1·343	+1·347	+0·861	−0·503	−1·329	−1·408
19 12	−1·840	−1·441	−0·499	+0·770	+1·449	+1·516	+1·352	+1·745	+1·302	−0·294	−1·897	−2·163
20 12	−1·358	−1·015	+0·062	+0·818	+1·002	+1·083	+0·920	+1·162	+0·886	−0·086	−1·602	−1·869
21 12	−0·028	−0·166	+0·576	+0·526	+0·130	+0·449	+0·266	−0·010	+0·003	−0·102	−0·807	−0·834
22 12	+0·988	+0·593	+0·945	+0·121	−0·568	−0·283	−0·087	−0·809	−0·780	−0·148	−0·019	+0·052
23 12	+0·773	+0·984	+0·757	−0·157	−0·741	−0·500	−0·289	−1·067	−1·043	−0·139	+0·661	+0·760

The curves corresponding to these excess variations are numbered 9 to 20, Plate XXXI.

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* In this and all the Tables that follow, the positive sign indicates a movement of the north end of the declination-magnet to the eastward of its normal direction, and the deviations from the normal are expressed in minutes of arc.

TABLE XI.—Showing, for the half years including the months from April to September in the several years 1859 to 1865, and in the whole period of seven years, the mean diurnal variation of Declination.

Bombay Astronomical Hours.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	Seven Years 1859 to 1865
h m								
0 12	-2·715	-2·867	-2·590	-2·354	-2·461	-2·325	-2·118	-2·490
1 12	-2·625	-2·623	-2·436	-2·245	-2·304	-2·128	-2·021	-2·340
2 12	-2·038	-1·992	-1·748	-1·508	-1·657	-1·689	-1·537	-1·738
3 12	-1·108	-0·997	-0·777	-0·605	-0·785	-0·717	-0·682	-0·810
4 12	-0·138	-0·122	+0·022	+0·149	-0·086	-0·115	-0·165	-0·065
5 12	+0·065	+0·223	+0·262	+0·135	+0·119	+0·102	+0·063	+0·138
6 12	-0·010	+0·164	+0·028	-0·111	-0·013	-0·109	-0·130	-0·026
7 12	-0·320	-0·206	-0·302	-0·326	-0·274	-0·313	-0·288	-0·290
8 12	-0·297	-0·281	-0·312	-0·383	-0·353	-0·360	-0·250	-0·319
9 12	-0·153	-0·208	-0·218	-0·223	-0·181	-0·209	-0·162	-0·193
10 12	-0·095	-0·064	-0·101	-0·102	-0·078	-0·079	-0·046	-0·081
11 12	+0·011	-0·001	+0·078	-0·008	+0·084	+0·073	+0·160	+0·057
12 12	+0·180	+0·109	+0·166	+0·157	+0·247	+0·182	+0·243	+0·183
13 12	+0·294	+0·259	+0·295	+0·308	+0·336	+0·336	+0·332	+0·309
14 12	+0·277	+0·282	+0·384	+0·350	+0·419	+0·417	+0·449	+0·368
15 12	+0·282	+0·222	+0·325	+0·351	+0·434	+0·407	+0·385	+0·344
16 12	+0·300	+0·301	+0·326	+0·300	+0·403	+0·409	+0·395	+0·348
17 12	+0·590	+0·758	+0·704	+0·626	+0·683	+0·612	+0·609	+0·655
18 12	+1·969	+2·008	+1·925	+1·794	+1·643	+1·613	+1·464	+1·774
19 12	+2·797	+2·969	+2·775	+2·497	+2·348	+2·287	+2·162	+2·548
20 12	+2·854	+2·891	+2·426	+2·235	+2·156	+2·243	+2·013	+2·403
21 12	+1·676	+1·556	+1·145	+1·107	+1·007	+1·242	+0·901	+1·233
22 12	-0·141	-0·348	-0·459	-0·472	-0·229	-0·314	-0·372	-0·334
23 12	-1·651	-2·025	-1·917	-1·674	-1·459	-1·555	-1·406	-1·670

Curves representing these variations are figured 23 to 30 on Plate XXXII.

TABLE XII.—Showing, for the half years including the months from January to March and October to December in the several years 1859 to 1865, and in the whole period of seven years, the mean diurnal variation of Declination.

Bombay Astronomical Hours.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	Seven Years 1859 to 1865.
h m								
0 12	-0·493	-0·556	-0·749	-0·754	-0·664	-0·664	-0·881	-0·680
1 12	-0·410	-0·458	-0·591	-0·446	-0·333	-0·332	-0·479	-0·436
2 12	-0·135	-0·156	-0·287	+0·270	+0·029	-0·087	+0·001	-0·052
3 12	-0·006	-0·019	+0·076	+0·285	+0·134	+0·158	+0·333	+0·137
4 12	-0·075	+0·126	+0·225	+0·305	+0·226	+0·192	+0·462	+0·209
5 12	-0·412	-0·236	-0·096	-0·215	-0·011	+0·024	+0·186	-0·109
6 12	-0·540	-0·468	-0·046	-0·187	-0·071	-0·037	+0·164	-0·169
7 12	-0·077	-0·077	+0·018	+0·013	+0·032	+0·079	+0·294	+0·040
8 12	+0·011	-0·034	+0·089	-0·011	+0·106	+0·089	+0·264	+0·073
9 12	-0·016	-0·039	+0·062	+0·050	+0·124	+0·106	+0·254	+0·077
10 12	+0·073	-0·021	+0·045	+0·065	+0·105	+0·187	+0·280	+0·105
11 12	+0·181	+0·141	+0·132	+0·098	+0·192	+0·213	+0·308	+0·181
12 12	+0·158	+0·140	+0·158	+0·120	+0·193	+0·285	+0·254	+0·187
13 12	+0·160	+0·154	+0·106	+0·138	+0·162	+0·229	+0·209	+0·165
14 12	+0·078	+0·073	+0·057	+0·055	+0·066	+0·124	-0·014	+0·063
15 12	-0·056	-0·058	-0·088	+0·166	-0·079	-0·041	-0·071	-0·032
16 12	-0·284	-0·242	-0·210	-0·158	-0·274	-0·140	-0·171	-0·211
17 12	-0·230	-0·396	-0·366	-0·313	-0·390	-0·361	-0·311	-0·338
18 12	-0·365	-0·431	-0·105	-0·267	-0·426	-0·393	-0·328	-0·331
19 12	-0·178	-0·058	-0·053	-0·139	-0·329	-0·260	-0·127	-0·163
20 12	+0·756	+0·688	+0·608	+0·431	+0·257	+0·216	+0·169	+0·446
21 12	+1·236	+1·207	+0·865	+0·783	+0·643	+0·524	+0·214	+0·782
22 12	+0·764	+0·864	+0·515	+0·311	+0·771	+0·246	-0·189	+0·469
23 12	-0·139	-0·144	-0·357	-0·561	-0·454	-0·350	-0·824	-0·404

Curves representing these variations are figured (in broken lines) on Plate XXXII. Nos. 23 to 30. Viewed together with the continuous curves from April to September, they show very distinctly the consistent character of the semi-annual inequality in the diurnal variation of declination in different years.

The half-excess for each hour of the numbers in the last column of Table XI. over those in the last column of Table XII., or the semi-annual inequality of the mean diurnal variation of declination, is as follows, the excesses being written in the order of the hours 0 to 23 :—

−0·905 −0·952 −0·843 −0·473 −0·137 +0·123 +0·071 −0·165 −0·175 −0·135 −0·093 −0·062
−0·002 +0·072 +0·152 +0·188 +0·279 +0·496 +1·052 +1·355 +0·978 +0·225 −0·399 −0·633

Fig. 21, Plate XXXI., is constructed from these numbers.

TABLE XIII.—Showing the mean diurnal variation of Declination for each of the years 1859 to 1865.

Bombay Astronomical Hours.	1859.	1860.	1861.	1862.	1863.	1864.	1865.
h m							
0 12	−1·604	−1·711	−1·669	−1·554	−1·562	−1·494	−1·499
1 12	−1·517	−1·540	−1·513	−1·345	−1·318	−1·230	−1·250
2 12	−1·086	−1·074	−0·917	−0·619	−0·814	−0·888	−0·768
3 12	−0·557	−0·508	−0·350	−0·160	−0·325	−0·279	−0·174
4 12	−0·106	+0·002	+0·123	+0·227	+0·070	+0·038	+0·148
5 12	−0·173	−0·006	+0·083	−0·040	+0·054	+0·063	+0·124
6 12	−0·275	−0·152	−0·009	−0·149	−0·042	−0·073	+0·017
7 12	−0·198	−0·141	−0·142	−0·156	−0·121	−0·117	+0·003
8 12	−0·143	−0·157	−0·111	−0·197	−0·123	−0·135	+0·007
9 12	−0·084	−0·123	−0·078	−0·086	−0·028	−0·051	+0·046
10 12	−0·011	−0·042	−0·028	−0·018	+0·013	+0·054	+0·117
11 12	+0·096	+0·070	+0·105	+0·045	+0·138	+0·143	+0·234
12 12	+0·169	+0·124	+0·162	+0·138	+0·220	+0·233	+0·248
13 12	+0·227	+0·206	+0·200	+0·223	+0·249	+0·282	+0·271
14 12	+0·177	+0·177	+0·220	+0·202	+0·242	+0·270	+0·217
15 12	+0·113	+0·082	+0·118	+0·258	+0·177	+0·183	+0·157
16 12	+0·008	+0·029	+0·058	+0·071	+0·064	+0·134	+0·112
17 12	+0·180	+0·181	+0·169	+0·156	+0·146	+0·125	+0·149
18 12	+0·802	+0·788	+0·910	+0·763	+0·608	+0·610	+0·568
19 12	+1·309	+1·455	+1·361	+1·179	+1·009	+1·013	+1·017
20 12	+1·805	+1·789	+1·517	+1·333	+1·206	+1·229	+1·091
21 12	+1·456	+1·381	+1·005	−0·945	+0·825	+0·883	+0·557
22 12	+0·311	+0·258	+0·028	−0·080	+0·271	−0·034	−0·280
23 12	−0·895	−1·084	−1·137	−1·117	−0·956	−0·952	−1·115

14. *Remarks on the regular Solar-diurnal Variations.*—Although the semi-annual inequality in the diurnal variation of the declination has been established by the researches of General SABINE as beyond a doubt a general feature in that variation, possessing the same characteristics in all parts of the globe, yet the regular progression from month to month in the diurnal variation has not, that I am aware, been much dwelt upon. It is shown, however, so distinctly in the Bombay Observations as to lead, on a first inspection of the curves, figs. 9 to 20, Plate XXXI., to the supposition that the law of variation is identical throughout the year, the extent only (including a reversal of direction) varying from month to month. But in this respect a different exposition of the character of the variation in different months shows that the first thought would be inaccurate. The deviations from the normal position of the magnet (δ_h) at each hour (h) may be expressed by the series.

$$\delta_h = A_1 \cos n + B_1 \sin n + A_2 \cos 2n + B_2 \sin 2n + A_3 \cos 3n + B_3 \sin 3n + \&c. \ldots\ldots (y),$$

where $n = h \times 15°$; and it is easy from each complete set of hourly values to deduce the values of the coefficients A_1, B_1, A_2, B_2, A_3, B_3, &c. This has been done for the mean solar-diurnal variation for each month of the year, and also for each half year in the period 1859 to 1865, with results as shown in the following Tables :—

TABLE XIV.—Showing the calculated values of the coefficients A_1, B_1, A_2, B_2, A_3 and B_3 in the series (y) which expresses the mean solar-diurnal variation for each month of the year for the whole year, and for different half-years.*

Months.		Values of the coefficients of the first three pairs of terms of the series (y).					
		A_1.	B_1.	A_2.	B_2.	A_3.	B_3.
January		+0·147	+0·028	−0·247	+0·025	+0·183	+0·202
February		−0·060	−0·003	−0·221	+0·034	+0·187	+0·184
March		−0·407	−0·175	−0·267	+0·367	+0·535	+0·220
April		−0·908	+0·048	−0·097	+0·828	+0·799	+0·153
May		−1·038	+0·044	+0·197	+1·057	+0·839	−0·051
June		−1·271	−0·011	+0·090	+1·119	+0·777	+0·075
July		−1·151	−0·130	+0·102	+1·018	+0·700	+0·059
August		−1·123	+0·160	+0·296	+1·262	+0·898	−0·059
September		−0·910	+0·230	+0·300	+1·090	+0·943	−0·096
October		−0·305	+0·063	+0·032	+0·379	+0·573	−0·040
November		+0·183	+0·200	−0·091	−0·187	+0·076	+0·019
December		+0·250	+0·225	−0·046	−0·196	+0·013	+0·082
Year		−0·549	+0·057	+0·004	+0·566	+0·544	+0·062
Half-years	April to September	−1·067	+0·057	+0·148	+1·062	+0·826	+0·013
	October to March	−0·032	+0·056	−0·140	+0·070	+0·261	+0·111
	January to June	−0·589	−0·011	−0·091	+0·572	+0·553	+0·130
	July to December	−0·509	+0·125	+0·099	+0·561	+0·534	−0·006

TABLE XV.—Showing the calculated values of the coefficients A_1, B_1, A_2, B_2, A_3, and B_3 in the series (y), which expresses the mean solar-diurnal variation for each half year, April to September and October to March, in the period 1859 to 1865.

Years.		Values of the coefficients of the first three pairs of terms of the series (y).					
		A_1.	B_1.	A_2.	B_2.	A_3.	B_3.
April to September	1859	−1·183	−0·007	+0·037	+1·230	+0·916	+0·073
	1860	−1·168	+0·046	+0·138	+1·308	+0·954	+0·020
	1861	−1·084	+0·085	+0·217	+1·125	+0·882	−0·028
	1862	−0·996	+0·042	+0·216	+0·989	+0·823	−0·043
	1863	−1·040	+0·088	+0·158	+0·973	+0·760	+0·041
	1864	−1·029	+0·048	+0·139	+0·952	+0·766	+0·030
	1865	−0·967	+0·096	+0·133	+0·857	+0·681	+0·001
October to March.	1859	−0·141	−0·103	−0·300	+0·043	+0·246	+0·141
	1860	−0·102	−0·107	−0·266	+0·058	+0·288	+0·188
	1861	−0·073	+0·028	−0·151	+0·165	+0·294	+0·143
	1862	−0·033	+0·042	−0·045	+0·048	+0·268	+0·053
	1863	+0·037	+0·076	−0·147	+0·031	+0·237	+0·141
	1864	+0·006	+0·147	−0·096	+0·022	+0·223	+0·108
	1865	+0·079	+0·309	+0·031	+0·127	+0·272	+0·002

The curves (Nos. 31 to 33, Plate XXXIII.) are constructed to exhibit the variations, in magnitude and direction, of the resultants of A_1 and B_1 , A_2 and B_2 , A_3 and B_3 respectively; O being the centre of co-ordinates, the A coefficients are set off in a vertical direction, upward if positive, and the B coefficients in a horizontal direction, to the right if positive, so that the distances from O to the points marked 1, 2, 3, &c., to 12 and ⊙r indicate the maximum deviations expressed by each pair of terms in the respective months January, February, March, &c., to December, and for the whole year, and the angles AO1, AO2, AO3, &c., reckoned in a right-handed direction from AO, when converted into time, show the hours at which the several maxima occur. The curves having reference to Göttingen astronomical hours, it will be necessary, in order to adapt them to Bombay time, to turn backward (*i.e.* in a left-handed direction) the zero direction line AO by an equivalent in each figure to $4^h 12^m$. It will be seen that this method of exhibiting variations brings to light in the regular solar-diurnal variations niceties of change in character which would fail to be noticed on a mere inspection of the respective ordinary representative curves. For instance, if the supposition mentioned above, that the change from month to month in the character of the solar-diurnal variation was one of extent only, not affecting the relative deviation at different hours, the variation at different parts of the year might be expressed in the form :—

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* Göttingen time was inadvertently used instead of Bombay time in the calculation of the coefficients A_1, B_1, &c.

$$\delta_h = C\{(A)_1 \cos n + (B)_1 \sin n + (A)_2 \cos 2n + (B)_2 \sin 2n + (A)_3 \cos 3n + (B)_3 \sin 3n + \&c.\},$$

where $(A)_1$, $(B)_1$, $(A)_2$, B_2, &c., would be constants, and C a function of the day of the year, or of the concurrent variable, the declination or right ascension of the sun. In this case a change in the value of any one of the coefficients A_1, B_1, A_2, B_2, &c. (equal respectively to $C \times (A)_1$, $C \times (B)_1$, $C \times (A)_2$ $C \times (B)_2$, &c.) would be attended by a proportional change in all the others, and the *direction* of the resultants of A_1 and B_1, A_2 and B_2, A_3 and B_3, &c., respectively, would be invariable throughout the year. Thus in the curves Nos. 31 to 33, Plate XXXIII., the points 1, 2, 3, &c., to 12 and $\odot r$ should in each case lie upon a straight line directed through the centre of co-ordinates. To such a requirement their positions do roughly conform; but there is sufficient evidence of system in their departures from the rule to render the latter worthy of independent consideration. The most striking feature about all the three curves is undoubtedly the existence of the semi-annual inequality in the values of the several maximum deviations, the greater values occurring about the northern solstice, the lesser about the southern solstice: this is in accord with the now well-known semi-annual inequality in the diurnal variation, which inequality is shown for Bombay by the curve No. 21, Plate XXXI., and by the numbers at the foot of Table XII., and possesses the character commonly attributed to it as general throughout the globe. The points *n*, *s*, *a*, *d* in figures 31 to 33, Plate XXXIII. mark the mean values of the coefficients respectively for the half-years, April to September, October to March, January to June, and July to December. Let us now confine our attention to the monthly excess or defect of the coefficients, A_1, B_1, A_2, B_2, A_3, B_3, &c., over the annual mean values; or, what is to the same effect, let us imagine the centre of co-ordinates in the figures 31 to 33, Plate XXXIII. removed to the points $\odot$ *r*, and let vertical lines be drawn upward from these points to A′; then will the lines *r*1, *r*2, *r*3, &c , to *r* 12 represent in magnitude and direction the monthly maximum deflections that must be geometrically superimposed upon the annual mean maximum deflection in order to produce the actual monthly maximum deflections; and the angles A′*r*1, A′*r*2, A′*r*3, &c., converted into time, will show the hours at which the monthly superimposed variation gives a maximum of deflection for each pair of terms of the series (*y*) which expresses it. Now, on a single glance at the three curves, it is perceived that (speaking generally) the points 1, 2, 3, &c., to 12 circulate in each case in a left handed direction about the points $\odot r$, the equinoctial months (3 and 4) and (9 and 10) lying on opposite sides of the closed curves. Moreover, the half-yearly points *n* and *s* and *a* and *d* lie in the same order about $\odot r$; and the interval between the latter two, though smaller, is not inconsiderable in comparison with the interval between the two former points ; and the relation of the four points to each other is much the same in each of the three figures, the straight line joining *a* and *d* approaching a direction at right angles to the line of junction of *n* and *s*. This would seem to imply that the summer form of the diurnal variation merges into the winter form, not solely by the gradual fading away (and inversion at other places) of the former, in which case the diurnal variation at the opposite equinoxes would be the same, but also partly by the superposition of a distinct variation, whose turning-points are considerably removed from those of the ordinary diurnal variation, and the extent of which is much more limited, and which moreover has an inverse character at the opposite equinoxes, at which times its influence on the ordinary mean diurnal variation is most sensible. It does not imply a retrograde rotation of the hours of maxima and minima accompanied by a gradual fading away of the variation, the variation still preserving a constant character in all respects except extent and turning-points, because in that case, whilst a single rotation occurs in the arrangement of the points 1, 2, 3, &c., to 12 in figure 31, there should be two and three rotations respectively in figures 32 and 33 and, in fact, there is only a single rotation in each of the three curves. Now, on referring to Plate XXV. of the "Philosophical Transactions of the Royal Society for 1863," where appear similar figures representing (in part) the diurnal variations of declination at Toronto and St. Helena, it is seen that these figures possess the characteristics just described of those for Bombay, with the exception that the rotation in the St. Helena curve is in a right-handed instead of a left-handed direction. To examine now more directly whether there be a semi-annual inequality in the diurnal variation of declination having opposite characteristics at the opposite equinoxes, and at the same time to eliminate that other semi-annual inequality whose times of opposition are the solstices, the mean diurnal variation was calculated for the half year January to June, and compared with the same for the half year July to December; half the excess, for each hour, of the former half year over the latter was taken to represent the inequality sought, which proved to be of so definite a character, and so similar for Bombay and Toronto, as to lead to the extension of the examination to all other stations for which reduced observations were accessible. Distinct similarity was then found to exist in the curves representing the inequality at all the north-latitude stations, Toronto, Kew, Greenwich, Pekin, and Bombay, whilst curves of form approaching to an inversion, with some modifications of the above, were found for the south-latitude stations, St. Helena and the Cape of Good Hope. Table XVI. and curves Nos. 37 to 43, Plate XXXV., show the character of this inequality for each station.

TABLE XVI.—Showing, for different stations, the mean diurnal variation of Declination for the half-year including the months January to June, and for the half-year including the months July to December, and also the half excess, at each hour, of the former over the latter.

Local Astronomical Hours (nearest).	Toronto.			Kew.			Greenwich.			Pekin.			Bombay.			Five North-Latitude Stations.	St. Helena.			Cape of Good Hope.			Two South-Latitude Stations.
	January to June.	July to December.	Half excess.	January to June.	July to December.	Half excess.	January to June.	July to December.	Half excess.	January to June.	July to December.	Half excess.	January to June.	July to December.	Half excess.	Mean of Half excess.	January to June.	July to December.	Half excess.	January to June.	July to December.	Half excess.	Mean of Half excess.
h																							
0	−3·86	−4·19	+0·16	−5·11	−5·15	+0·02	−3·82	−4·13	+0·15	−1·38	−1·72	+0·17	−1·57	−1·60	+0·02	+0·06	+0·81	+0·70	+0·05	+0·13	−0·16	+0·14	+0·09
1	−5·05	−5·08	+0·01	−6·28	−6·11	−0·08	−5·40	−5·30	−0·05	−2·37	−2·15	−0·11	−1·45	−1·33	−0·06	−0·12	+0·79	+0·60	+0·09	+1·12	+0·67	+0·22	+0·15
2	−4·99	−4·75	−0·12	−6·02	−5·59	−0·21	−5·88	−5·20	−0·34	−2·68	−1·95	−0·36	−1·02	−0·78	−0·12	−0·25	+0·49	+0·31	+0·09	+1·54	+1·11	+0·21	+0·15
3	−4·14	−3·51	−0·31	−4·54	−4·03	−0·25	−4·93	−4·03	−0·45	−2·35	−1·35	−0·50	−0·47	−0·20	−0·13	−0·34	+0·16	−0·08	+0·12	+1·28	+1·05	+0·11	+0·11
4	−2·82	−2·14	−0·34	−2·83	−2·37	−0·23	−3·38	−2·40	−0·49	−1·63	−0·79	−0·42	−0·02	+0·16	−0·09	−0·31	−0·24	−0·48	+0·12	+0·74	+0·52	+0·11	+0·11
5	−1·51	−1·07	−0·22	−1·47	−1·05	−0·21	−1·73	−0·83	−0·45	−0·96	−0·33	−0·31	−0·04	+0·07	−0·06	−0·21	−0·48	−0·63	+0·07	+0·32	+0·08	+0·12	+0·09
6	−0·69	−0·26	−0·21	−0·48	−0·29	−0·09	−0·38	+0·15	−0·26	−0·39	−0·19	−0·10	−0·17	−0·02	−0·07	−0·12	−0·33	−0·44	+0·05	+0·21	+0·13	+0·04	+0·04
7	−0·28	−0·04	−0·12	+0·18	+0·25	−0·03	+0·58	+0·88	−0·15	−0·19	−0·22	+0·01	−0·19	−0·06	−0·07	−0·06	−0·02	−0·13	+0·05	+0·37	+0·35	+0·01	+0·03
8	−0·12	−0·24	+0·06	+0·57	+0·79	−0·11	+1·20	+1·38	−0·09	−0·14	−0·24	+0·05	−0·16	−0·08	−0·04	−0·03	+0·09	+0·06	+0·01	+0·44	+0·46	−0·01	0·00
9	+0·42	+0·62	−0·10	+0·88	+1·09	−0·10	+1·67	+1·88	−0·10	−0·07	−0·13	+0·03	−0·07	−0·05	−0·01	−0·05	+0·18	+0·19	0·00	+0·46	+0·51	−0·02	−0·01
10	+0·68	+0·72	−0·02	+1·12	+1·35	−0·11	+1·90	+2·07	−0·08	+0·08	−0·08	+0·08	−0·01	+0·03	−0·02	−0·02	+0·26	+0·29	−0·01	+0·46	+0·50	−0·02	−0·01
11	+0·76	+0·66	+0·05	+1·27	+1·48	−0·10	+1·98	+2·02	−0·02	+0·25	+0·06	+0·09	+0·11	+0·13	−0·01	+0·01	+0·29	+0·28	0·00	+0·41	+0·54	−0·06	−0·03
12	+0·61	+0·64	−0·01	+1·24	+1·62	−0·19	+1·83	+1·82	0·00	+0·43	+0·16	+0·13	+0·19	+0·18	0·00	0·00	+0·29	+0·18	+0·05	+0·40	+0·56	−0·08	−0·01
13	+0·60	+0·52	+0·04	+1·18	+1·39	−0·10	+1·67	+1·48	+0·09	+0·57	+0·33	+0·12	+0·24	+0·23	0·00	+0·02	+0·20	+0·07	+0·06	+0·46	+0·56	−0·05	0·00
14	+0·55	+0·49	+0·03	+1·29	+1·49	−0·10	+1·33	+1·22	+0·05	+0·59	+0·40	+0·09	+0·23	+0·20	+0·01	+0·02	+0·17	0·00	+0·08	+0·42	+0·48	−0·03	+0·02
15	+0·75	+0·68	+0·03	+1·46	+1·57	−0·05	+1·17	+1·03	+0·07	+0·38	+0·46	−0·04	+0·13	+0·19	−0·03	+0·01	+0·17	−0·05	+0·11	+0·42	+0·40	+0·01	+0·06
16	+1·25	+1·00	+0·12	+1·86	+1·89	−0·01	+1·25	+1·00	+0·12	+0·55	+0·50	+0·02	+0·03	+0·11	−0·04	+0·04	+0·18	−0·11	+0·14	+0·37	+0·30	+0·03	+0·08
17	+2·00	+1·86	+0·07	+2·62	+2·40	+0·11	+1·40	+1·15	+0·12	+0·62	+0·52	+0·05	+0·12	+0·19	−0·03	+0·08	+0·27	−0·02	+0·14	+0·30	+0·24	+0·03	+0·08
18	+3·08	+2·89	+0·09	+3·24	+2·89	+0·17	+1·73	+1·35	+0·19	+0·93	+0·94	0·00	+0·67	+0·77	−0·06	+0·08	+0·50	+0·38	+0·06	+0·19	−0·09	+0·14	+0·10
19	+3·97	+4·02	−0·02	+3·86	+3·30	+0·28	+2·07	+1·62	+0·22	+1·47	+1·55	−0·04	+1·18	+1·20	−0·01	+0·11	−0·10	−0·07	−0·01	−0·50	−0·63	+0·06	+0·02
20	+4·55	+4·33	+0·11	+4·18	+3·41	+0·38	+2·47	+1·82	+0·32	+2·13	+1·99	+0·07	+1·52	+1·33	+0·10	+0·21	−1·14	−0·52	−0·31	−2·08	−1·67	−0·20	−0·25
21	+3·85	+3·41	+0·22	+3·64	+2·58	+0·53	+2·40	+1·62	+0·39	+2·40	+1·80	+0·30	+1·25	+0·76	+0·25	+0·35	−1·62	−0·65	−0·48	−3·16	−2·29	−0·43	−0·45
22	+1·52	+1·14	+0·19	+0·88	+0·04	+0·42	+1·28	+0·35	+0·46	+1·55	+0·93	+0·31	+0·37	−0·23	+0·30	+0·32	−1·15	−0·36	−0·39	−2·84	−2·60	−0·12	−0·25
23	−1·45	−1·94	+0·24	−2·43	−2·94	+0·25	−1·03	−1·78	+0·37	+0·03	−0·43	+0·23	−0·85	−1·22	+0·19	+0·21	+0·04	+0·32	−0·14	−1·48	−1·34	−0·07	−0·10

Now an inspection of Plate XIV. in the "Philosophical Transactions for 1863" suffices to convince that the mean diurnal variation of declination, whilst subject at different places to differences of character of a minor order, is mainly of the same general type throughout the globe: the range may vary or even the inflections of the representative curve may be inverted, but the relation as to the kind of flexure of any one principal feature of the curve to the remaining principal features is the same everywhere :. in the typical variation a maximum or minimum occurs between twenty and twenty-one hours, and a minimum or maximum between one and two hours; and the great amount of change takes place between the hours seventeen and five, whilst deviations from the normal position of the magnets of comparatively only small extent occur during the remaining hours. To the same type belongs that semi-annual inequality which has opposite features at the opposite solstices, and which may be called the solstitial semi-annual inequality to distinguish it from the equinoctial semi-annual inequality, as that might be named which has opposite characteristics at the opposite equinoxes,—with this difference, that the turning point, which in the typical mean variation occurs at twenty or twenty-one hours, takes place in the inequality a full hour earlier. Thus the mean diurnal variation for each of the half years, April to September and October to March, being the result of the combination of two variations of the same kind, will also be of the typical character, but with a small difference in the time of the occurrence of the twenty to twenty-one hours turning-point. Let us now examine the character of the equinoctial semi-annual inequality as exhibited in the curves 37 to 43, Plate XXXV., and compare it with the type curve of the mean diurnal variation. In the first place, it is seen that, as in the type, there is scarcely any change during the night hours, and that the main variation occurs during half the day, in this case between eighteen hours and six hours; secondly, the range of variation differs from about half a minute to nearly one minute of arc; thirdly, the hour of noon is that at which the deviations due to this variation pass through zero, and on each side of which the inflections of the curve are inversely, but in respect to north-latitude stations symmetrically disposed; fourthly, the turning-points are twenty-one hours and three hours, the former being a maximum and the latter a minimum for north-latitude stations from January to June, and for south-latitude stations from July to December, and *vice versa*, for north-latitude stations from July to December, and for south-latitude stations from January to June. The concurrent testimony of the five widely distributed north-latitude stations leaves, I think, very little room for doubt that this inequality is an expression of real phenomena common to the whole of the northern magnetic hemisphere. From the general agreement, qualified by the fact that the afternoon inflections are comparatively much subdued, of the curves of two stations of such comparative proximity as St. Helena and the Cape of Good Hope, it would be less safe to generalize as to the southern magnetic hemisphere; but there is abundant evidence of the existence of a definite, and in some respects different, law to that which prevails in the northern hemisphere to encourage further inquiry in this direction.* So far as I am aware, this is the first time that any diurnal variation of magnetical phenomena has been pointed out in which the sun's position relatively to the meridian of the place appears so directly related to the expressed phenomena. To exhibit the general character of this variation more distinctly the curves Nos. 44 and 45, Plate XXXV., are drawn on a larger scale to represent the average variation for the north and south latitude stations respectively. For all the stations, except St. Helena and Greenwich, the above are the results derived from the observations after the separation of the larger disturbances by the method above described; for St. Helena the effect of disturbances on the diurnal variation is very slight, and all observations are included; for Greenwich complete days of large disturbance are thrown aside, and the remainder used for the calculation of the diurnal variation.

15. *Solar-diurnal Inequality.*—The following table shows the mean diurnal inequality when all observations, disturbed and undisturbed, are included in the calculations as compared

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* An examination of the Hobarton observations (including all disturbances) resulted in a curve corresponding closely with those of the north-latitude stations, but of small range.

with the mean diurnal variation after the exclusion of disturbances exceeding 1′·4 in amount; and it is seen that at Bombay the disturbances have a very slight effect on the diurnal variation, the largest difference at any hour not exceeding 0′·061.

TABLE XVII.

	Bombay Astronomical Hours.											
	h m 0 12	h m 1 12	h m 2 12	h m 3 12	h m 4 12	h m 5 12	h m 6 12	h m 7 12	h m 8 12	h m 9 12	h m 10 12	h m 11 12
Mean diurnal inequality.	−1·590	−1·424	−0·936	−0·342	+0·064	+0·023	−0·088	−0·108	−0·084	−0·032	+0·025	+0·144
Mean diurnal variation.	−1·585	−1·388	−0·896	−0·337	+0·072	+0·015	−0·098	−0·125	−0·123	−0·059	+0·012	+0·118
Excess of inequality over variation.	−0·005	−0·036	−0·040	−0·005	−0·008	+0·008	+0·010	+0·017	+0·039	+0·027	+0·013	+0·026

	Bombay Astronomical Hours.											
	h m 12 12	h m 13 12	h m 14 12	h m 15 12	h m 16 12	h m 17 12	h m 18 12	h m 19 12	h m 20 12	h m 21 12	h m 22 12	h m 23 12
Mean diurnal inequality.	+0·212	+0·258	+0·238	+0·174	+0·084	+0·159	+0·719	+1·216	+1·388	+0·951	+0·006	−1·052
Mean diurnal variation.	+0·185	+0·237	+0·215	+0·155	+0·068	+0·157	+0·721	+1·192	+1·424	+1·006	+0·067	−1·037
Excess of inequality over variation.	+0·027	+0·021	+0·023	+0·019	+0·016	+0·002	−0·002	+0·024	−1·036	−0·055	−0·061	−0·015

16. *Variation from year to year in the range of the mean diurnal variation of Declination.*

TABLE XVIII.—Showing the range of the mean diurnal variation of Declination for the several years 1859 to 1865, and for the component half-years (April to September, and January to March and October to December).

Years.	Range.		
	Year.	Half-year, April to September.	Half-year, October to March.
1859.	2·913	5·569	1·776
1860.	3·500	5·836	1·763
1861.	3·186	5·365	1·614
1862.	2·887	4·851	1·537
1863.	2·768	4·809	1·435
1864.	2·723	4·612	1·188
1865.	2·590	4·280	1·343

The regular progression in these numbers, the equivalent of which is shown also by the varying range of the curves Nos. 23 to 29, Plate XXXII., is very marked, and tends towards maxima in 1859-60 and minima in 1864-65, in near correspondence with the maxima and minima of the decennial variation of aggregate annual disturbance. In order to show the periodicity, the ranges have also been calculated of the mean diurnal inequality (including disturbances) for the larger number of years, 1848 to 1864; and the same has been done for the Greenwich observations (excluding certain complete disturbed days), with the results subjoined.

TABLE XIX.—Showing the range of the mean diurnal inequality of Declination at Bombay in the several years 1848 to 1864, and at Greenwich in the several years 1848 to 1857, with the corresponding ratios of the range of each year to the average range.

Years		1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.
Bombay	Range	3·491	3·248	3·294	2·965	2·611	2·728	2·416	2·576	2·453	2·459	2·720	3·117	3·551	3·282	2·790	2·568	2·652
	Ratios	1·24	1·16	1·17	1·06	0·93	0·97	0·86	0·92	0·87	0·88	0·97	1·11	1·26	1·17	0·99	0·91	0·94
Greenwich	Range	11·4	10·3	10·0	8·4	8·0	6·9	7·2	7·0	5·9	5·6							
	Ratios	1·42	1·29	1·25	1·05	1·00	0·86	0·90	0·87	0·74	0·70							

In calculating the average range (2′·808) for Bombay, double value was given to the ranges from 1853 to 1859; for Greenwich it was taken of such a value (8′·0) as would make the sum of the ratios equal to the sum of the ratios at Bombay for the same years. Two periods of maximum range are now seen to exist not far from the years of maximum disturbance with a minimum intervening, and an approach to a second minimum near the last year (1864). The diminishing progression of the ranges for Greenwich being (with one slight exception) continuous, shows no signs of periodicity when viewed by itself; but the succession of ratios so much resembles that which appears for the same years (1848 to 1857) at Bombay, that it is reasonable to suppose that on the extension of the results for Greenwich beyond 1857 an increasing progression would begin to show itself, as is the case at Bombay. The proportion, however, of the maximum to the minimum range at Greenwich is about 2, whilst at Bombay it is only about 1·5.

The variation in the range of the mean diurnal variation of declination is also indicated by the corresponding variation in the magnitude of the maximum deflections for the half years April to September, for each of the first three pairs of terms of the series (y) as delineated on Plate XXXIV., figs. 34 to 36; but there is also in these figures a curious likeness, though not equivalent as to time, in the arrangement of the points for the successive years about the centre of co-ordinates indicative of systematic change from year to year in the law as well as in the extent of variation.

17. *Annual Variation and Secular Change.*—The observations having been repeatedly interrupted in the year 1861, it is better perhaps to reject that year and use only the two continuous series of observations, 1859 and 1860, and 1862 to 1865, in the deduction of secular and annual variations. The following Tables will, however, be filled up for that year, although no use is made of the numbers in the calculations applied.

TABLE XX.—Showing the mean monthly and annual values of Easterly Declination as deduced from the readings of GRUBB's Declinometer in the several years 1859 to 1865.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November.	December.	Year.
1859.	20·592	20·835	21·130	20·868	21·227	21·258	21·366	21·190	21·569	22·092	22·375	22·913	21·451
1860.	23·021	23·037	23·498	23·460	23·562	24·045	24·209	24·506	24·226	24·294	24·932	25·150	23·995
1861.	25·414	25·685	26·158	26·136	26·023	26·100	25·902	28·861	29·041	29·185	28·632	28·897	27·169
1862.	29·042	29·014	29·178	29·703	29·367	30·416	30·992	31·049	31·303	31·677	31·820	32·464	30·502
1863.	32·696	32·755	33·948	34·334	33·633	33·424	33·802	33·783	34·407	34·742	34·529	35·471	33·960
1864.	35·262	35·032	35·379	35·331	35·710	36·016	36·459	36·716	37·126	38·043	38·167	38·198	36·453
1865.	38·568	38·618	38·680	37·816	39·004	39·499	40·143	41·251	41·489	41·717	41·241	42·311	40·028
Mean of six years, omitting 1861	29·863	29·882	30·302	30·252	30·417	30·776	31·162	31·416	31·687	32·094	32·177	32·751	

The numbers in the last column of Table XX. give values of the annual secular increase of easterly declination as follows:—

From 1859 to 1860 the increase = 2′·544
1862 to 1863 „ = 3·458
1863 to 1864 „ = 2·493
1864 to 1865 „ = 3·575

Mean............... = 3·017[*].

This gives a secular increase at the rate of 0′·2515 per month; and applying corrections at this rate to reduce the mean numbers at the foot of Table XX. to the common epoch, the 1st January of the mean year, we have

TABLE XXI.

Months	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Mean for mean year	29·863	29·882	30·302	30·252	30·417	30·776	31·162	31·416	31·687	32·094	32·177	32·751	
Correction	·000	—·251	—·503	—·754	—1·006	—1·257	—1·509	—1·760	—2·012	—2·263	—2·515	—2·766	
Means corrected.	29·863	29·631	29·799	29·498	29·411	29·519	29·653	29·656	29·675	29·831	29·662	29·985	29·682
Annual variation	+·181	—·051	+·117	—·184	—·271	—·163	—·029	—·026	—·007	+·149	—·020	+·303	

The last line of numbers is far from presenting the decidedly systematic and regular appearance that is found by General Sabine (see "Philosophical Transactions," 1863, pages 291 to 295) from the similar treatment of the observations of Kew and Hobarton; let us therefore examine, as the similar results for those places and for St. Helena and the Cape of Good Hope would suggest, whether (failing a regular periodical progression from month to month) there be any semi-annual inequality of Declination at Bombay. Combining together the months April to September and the months January to March, and October to December, so as to eliminate secular change, we get the following results.

TABLE XXII.—Showing the mean values of Easterly Declination for April to September, and for January to March, and October to December in each of the years 1859, 1860, and 1862 to 1865; and the excess of the mean for the former half year over the mean for the latter in each year.

Years	1859.	1860.	1861.	1862.	1863.	1864.	1865.
April to September	21·246	24·001	......	30·472	33·897	36·226	39·867
January to March, and October to December	21·656	23·989	......	30·532	34·023	36·680	40·189
Excess of April to September over October to March.	—·410	+·012	......	—·060	—·126	—·454	—·322
Mean excess	—0′·227						

The signs of the differences in five of the six years are negative, whilst the difference for the sixth year has a slight positive value. The inference to be drawn thence is that there is some probability that the north end of the declination-magnet points at Bombay 0′·227 [†] more to the westward in the months April to September than in the months January to March and October to December; and the same result exactly is arrived at if all the disturbed observations are included in the calculation of the mean values of declination. I cannot regard the evidence as conclusive, however, for two reasons,—first, because the observations at the four stations Kew, Hobarton, St. Helena, and the Cape of Good Hope agree in showing that at those places the north end of the declination-magnet points, when the sun is north of the equator, to the eastward of its mean annual position, which is contrary to what is found for Bombay; and, secondly, because the annual variations at Bombay, calculated, as in Table XXI., for each individual year, are irregular and inconsistent with each other to an extent much exceeding the whole range of the semi-annual inequality. These irregularities are attributable, I believe, almost entirely to the defect of the reading-transit instrument of the declinometer alluded to in paragraph 7. The annual variations found for the different years are as follows :—

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[*] It will be seen by a reference to Table III. on page 4 of the Tables of Results of the 'Bombay Magnetical Observations for 1864,' that the annual secular increase of Declination, which from 1846 to 1865 had an average value of only 1′·24, has since the year 1859 been considerably greater, as shown above.

[†] The fact that this is exactly the magnitude of the semi-annual inequality at St. Helena renders the correctness of the inference more probable.

TABLE XXIII.—Showing the annual variation of Declination calculated, after the elimination of secular change at the rate of 0′·2515 per month, for the several years 1859, 1860, and 1862 to 1865.

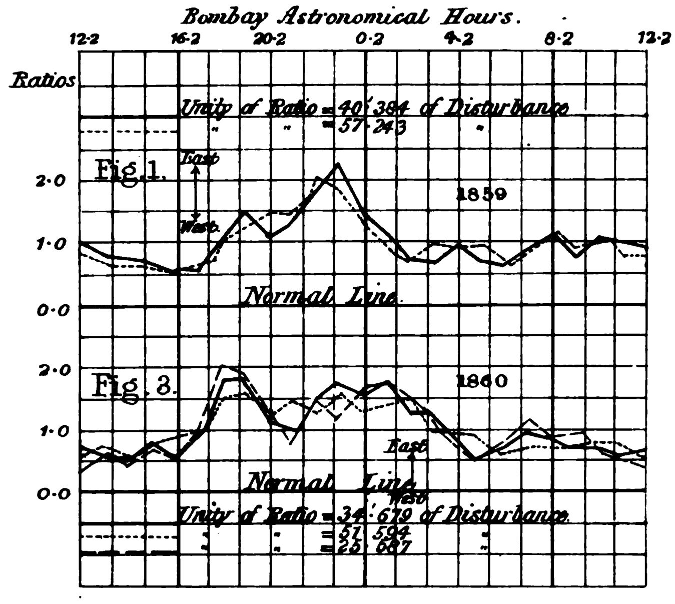
Years.	January.	February	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1859	+·524	+·516	+·559	+·046	+·153	−·067	−·211	−·638	−·511	−·239	−·208	+·079
1860	+·409	+·174	+·383	+·094	−·056	+·176	+·088	+·134	−·398	−·581	−·195	−·228
1861												
1862	−·077	−·356	−·444	− ·170	−·758	+·040	+·364	+·170	+·172	+·295	+·186	+·579
1863	+·119	−·073	+·868	+1·003	+·050	−·410	−·284	−·554	−·182	−·098	−·563	+·128
1864	+·192	−·289	−·194	− ·493	−·366	−·311	−·120	−·114	+·042	+·410	+·582	+·362
1865	−·077	−·278	−·468	−1·583	−·647	−·403	−·011	+·846	+·832	+·809	+·081	+·900

PLATE XXX.

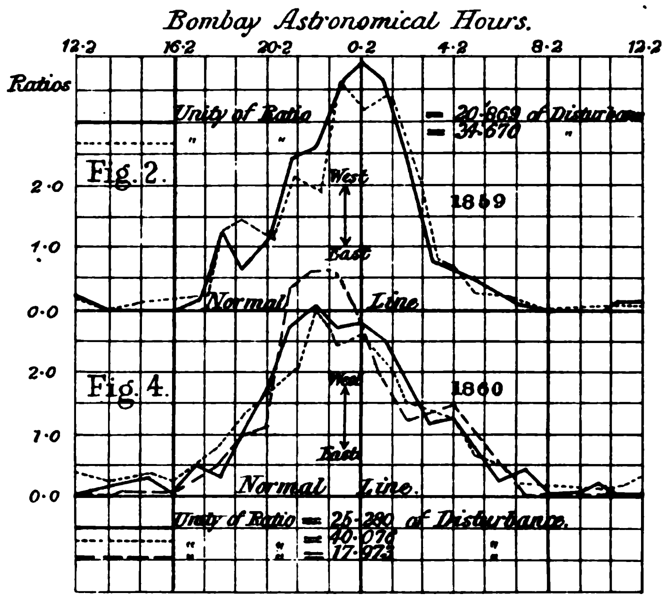
Diurnal Variations of Easterly and of Westerly Disturbance with different separating values.

.... Separating Value = 1'.0
———————————— = 1.4
— — — — — — — — — — = 1.7

Easterly. Disturbances.

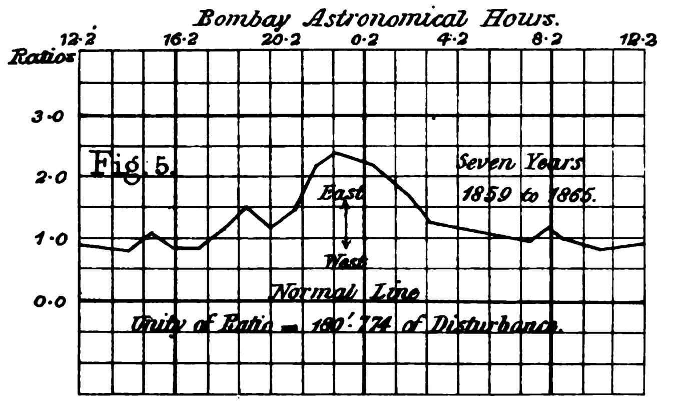


Westerly Disturbances.

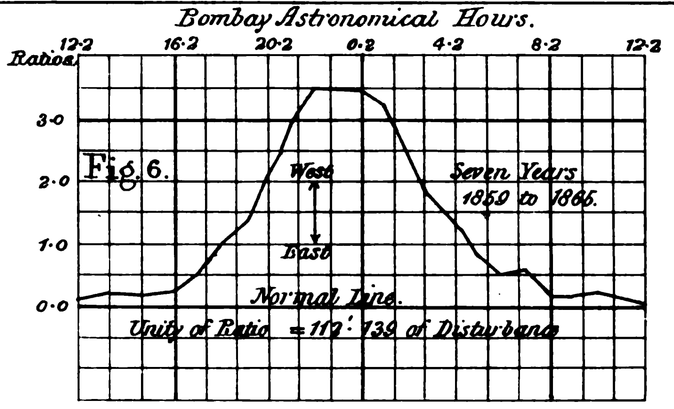


Diurnal Variations of Easterly and of Westerly Disturbance
Separating Value — 1'.4

Easterly Disturbances.

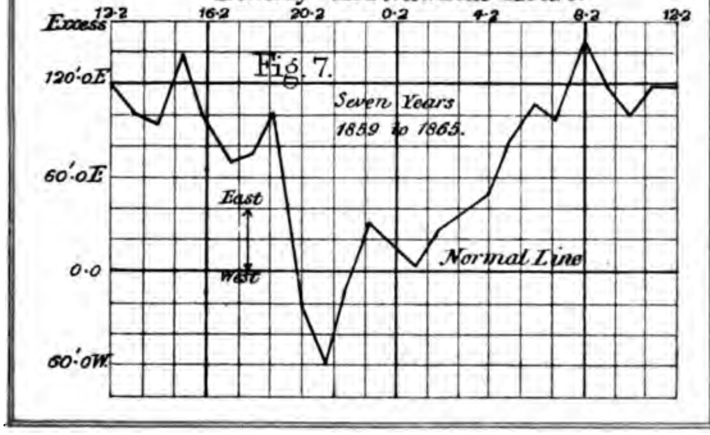


Westerly Disturbances.



Disturbance Diurnal Variation,

or the excess, at each hour, of the aggregate of Easterly Disturbances over the aggregate of Westerly Disturbances.



Mean Diurnal Variation of Declination for the seven years 1859 to 1865.

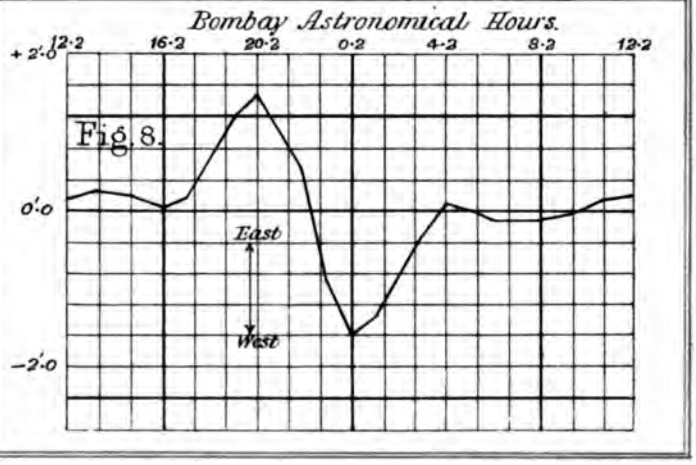
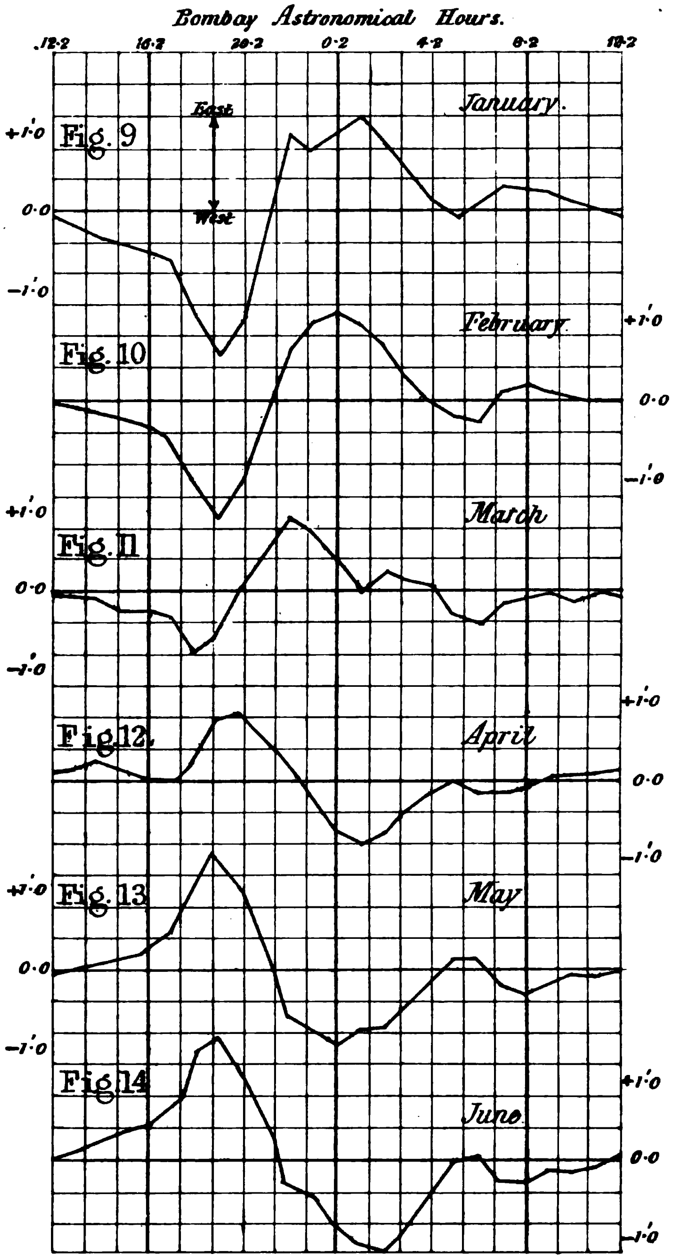
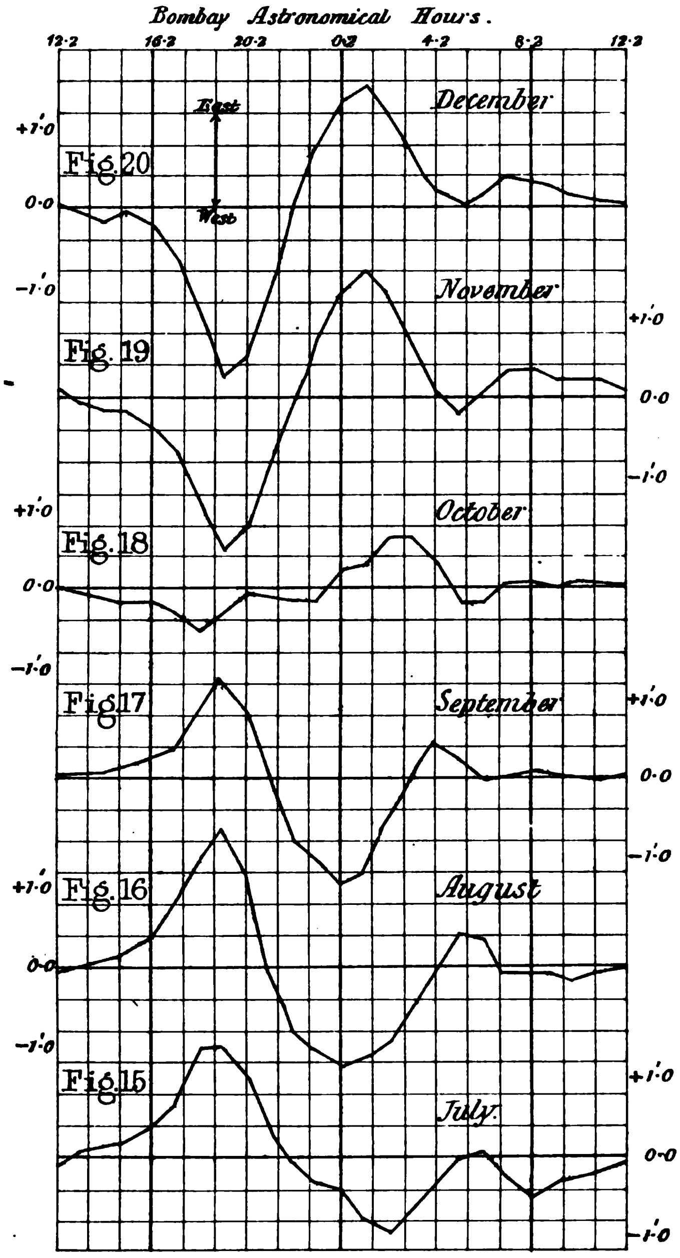


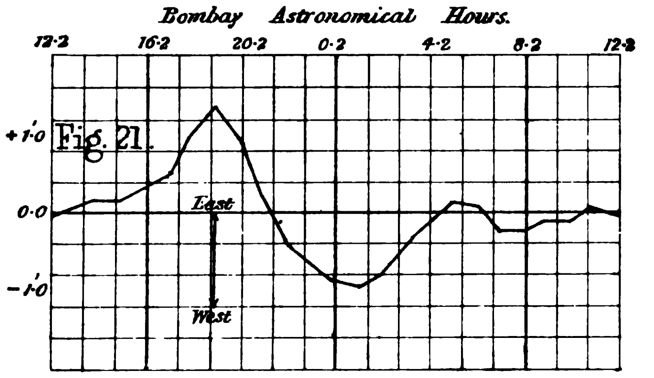
PLATE XXXI.

Excess of the Diurnal Variation of Declination in each month over the Mean Diurnal Variation for the whole year.





Excess of the Diurnal Variation of Declination for the half-year April to September over the Mean Diurnal Variation for the whole year.



Excess of the Diurnal Variation of Declination for the half year January to June over the Mean Diurnal Variation for the whole year.

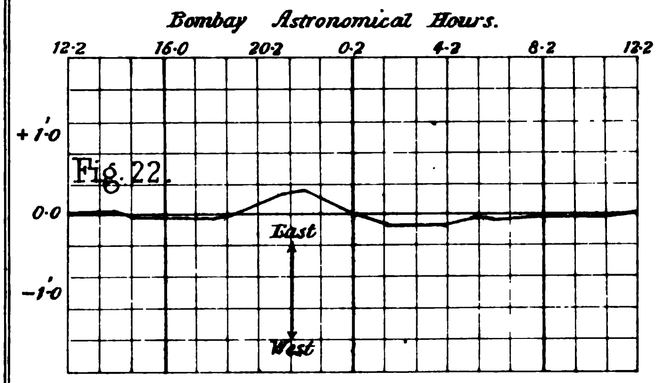


PLATE XXXII

Mean Diurnal Variation of Declination for the half years April to September and October to March in each of the years 1859 to 1865 and for the whole Period of seven years.

———————— *April to September.*

- - - - - - - - - - - - *October to March.*

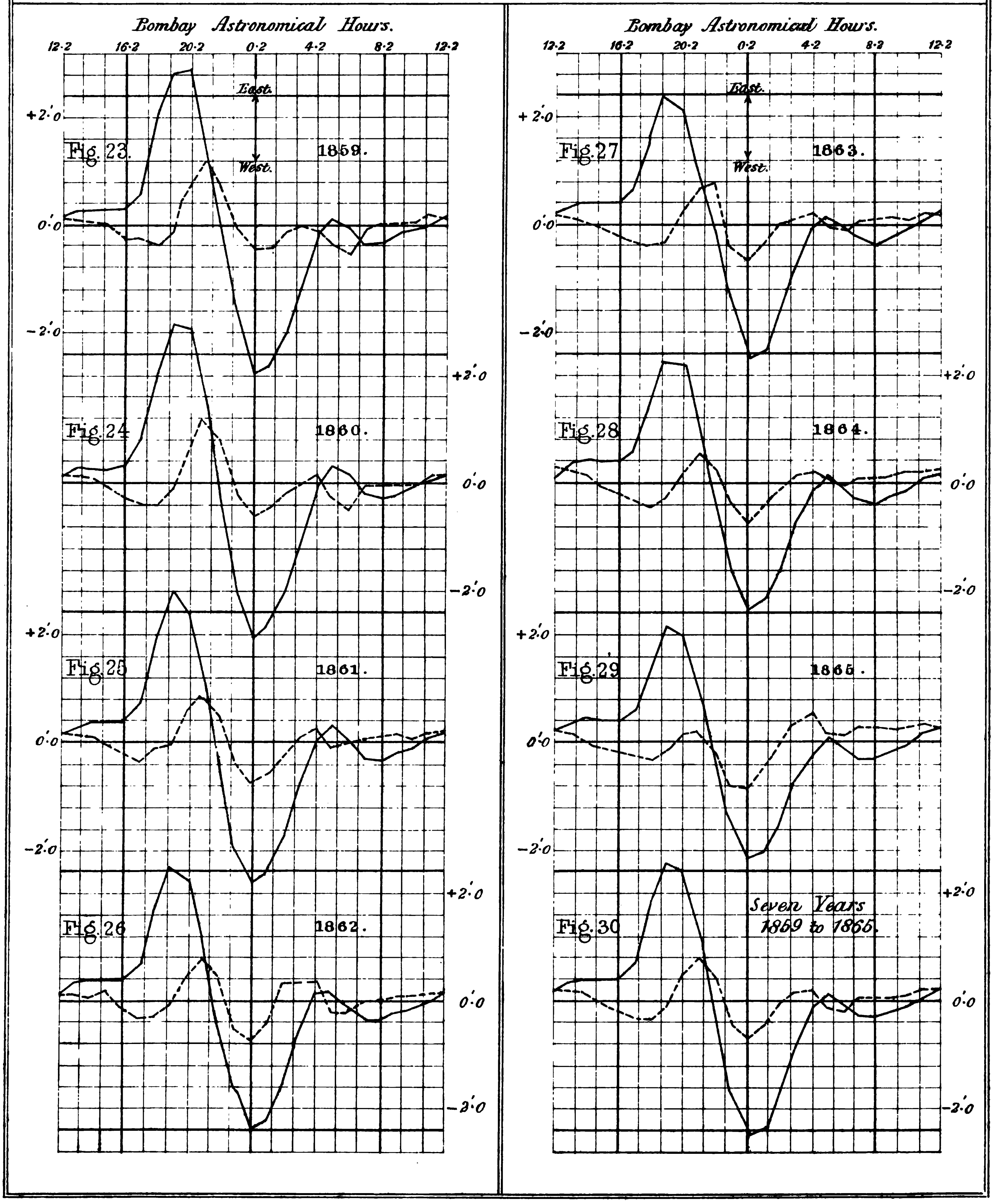


PLATE XXXIII.

Values of the coefficients of the series (y) which expresses the Mean Diurnal Variation of Declination at Bombay in each month of the year. See paragraph 14. The numbers 1, 2, 3, 4 &c represent the months January, February, March, April &c.

A_1 *and* B_1

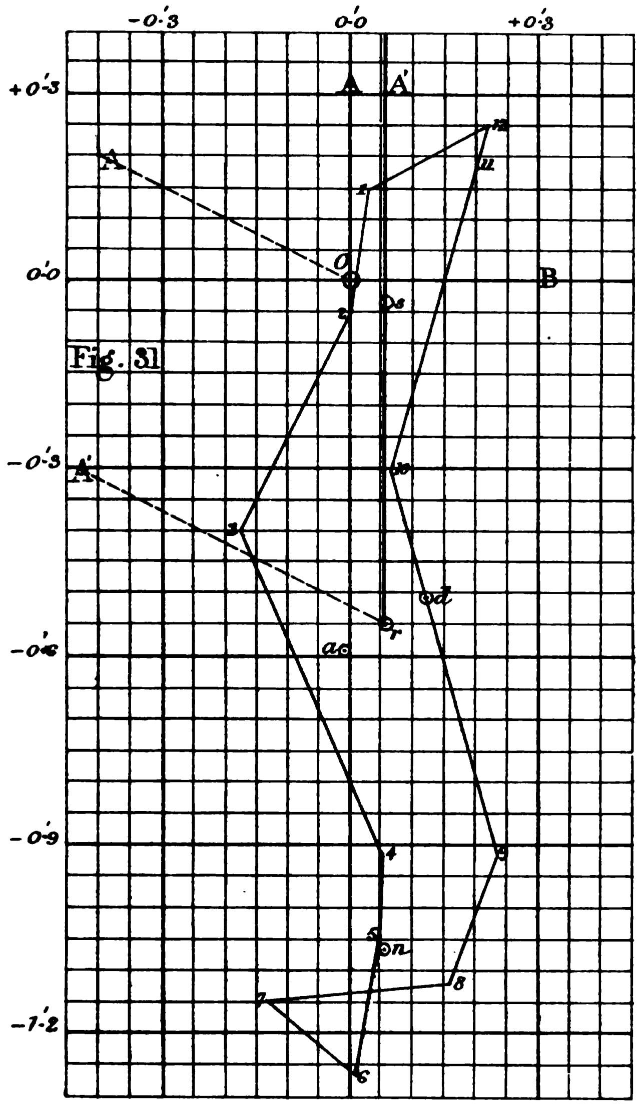


Fig. 31

A_2 *and* B_2

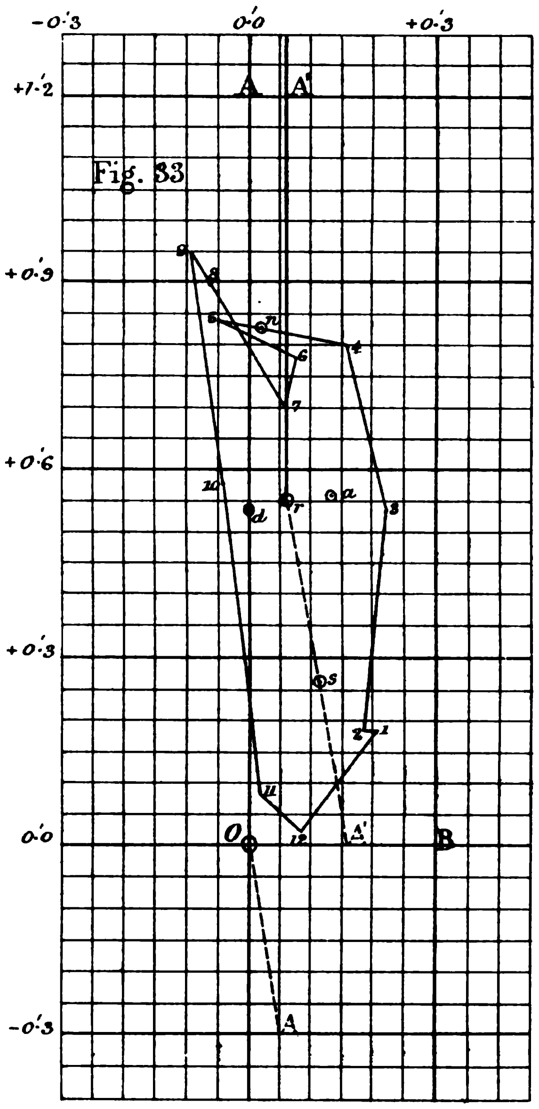


Fig. 33

A_3 *and* B_3

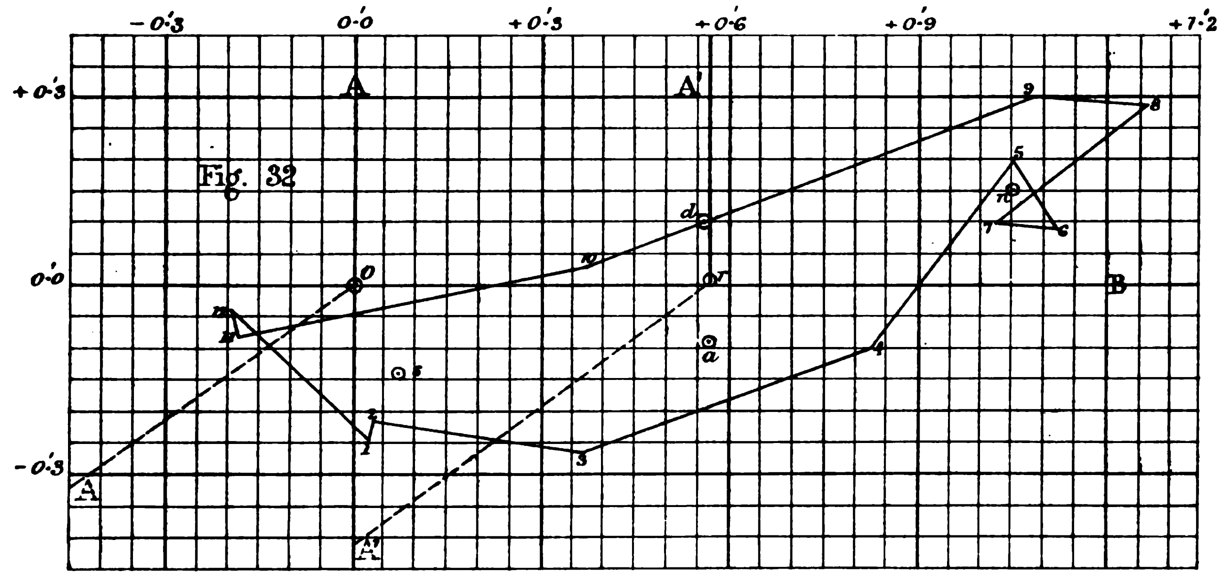


Fig. 32

The directions OA and rA' correspond to noon of Gottingen Mean time, and the directions OA and rA' (broken lines) to noon of Bombay Mean time.

PLATE XXXIV.

Values of the coefficients of the series (y) which expresses the Mean Diurnal Variation of Declination at Bombay in each of the half-years of 1859 to 1865. See paragraph 14. The numbers 9, 0, 1, 2, 3, 4 and 5 represent the years 1859 to 1865 respectively.

———— *April to September.* - - - - - - - - - *October to March.*

A_1 *and* B_1

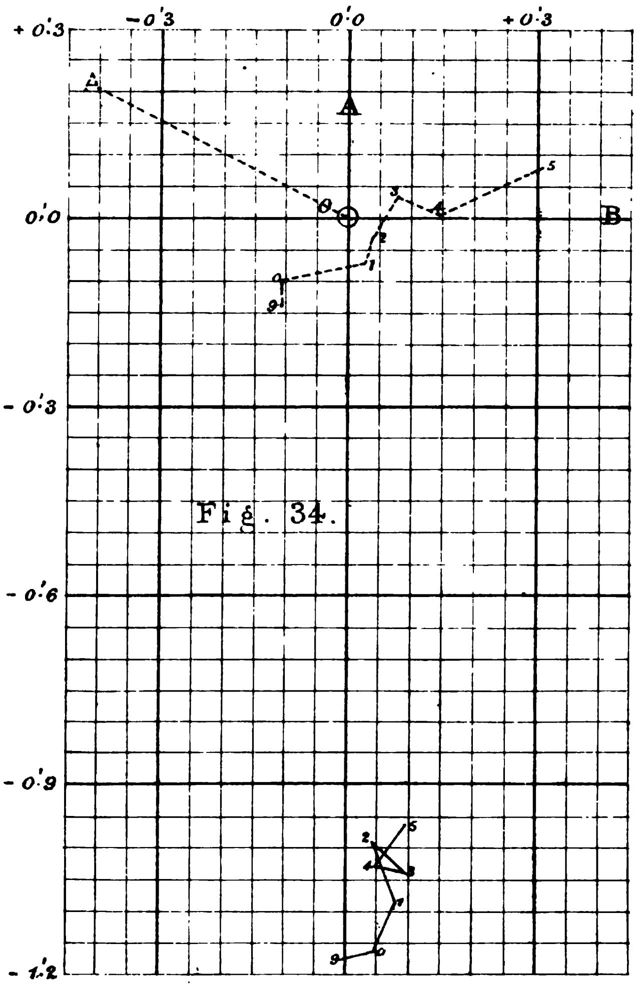


Fig. 34.

A_2 *and* B_2

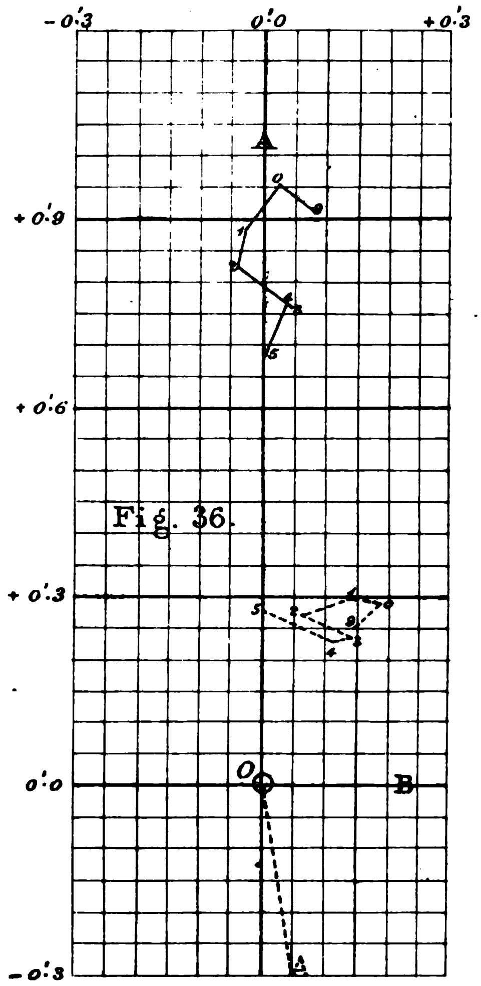


Fig. 36.

A_3 *and* B_3.

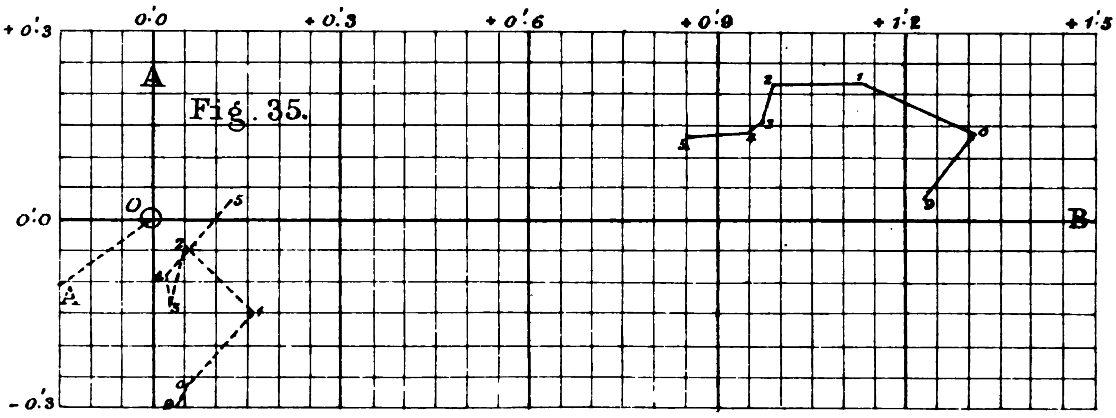


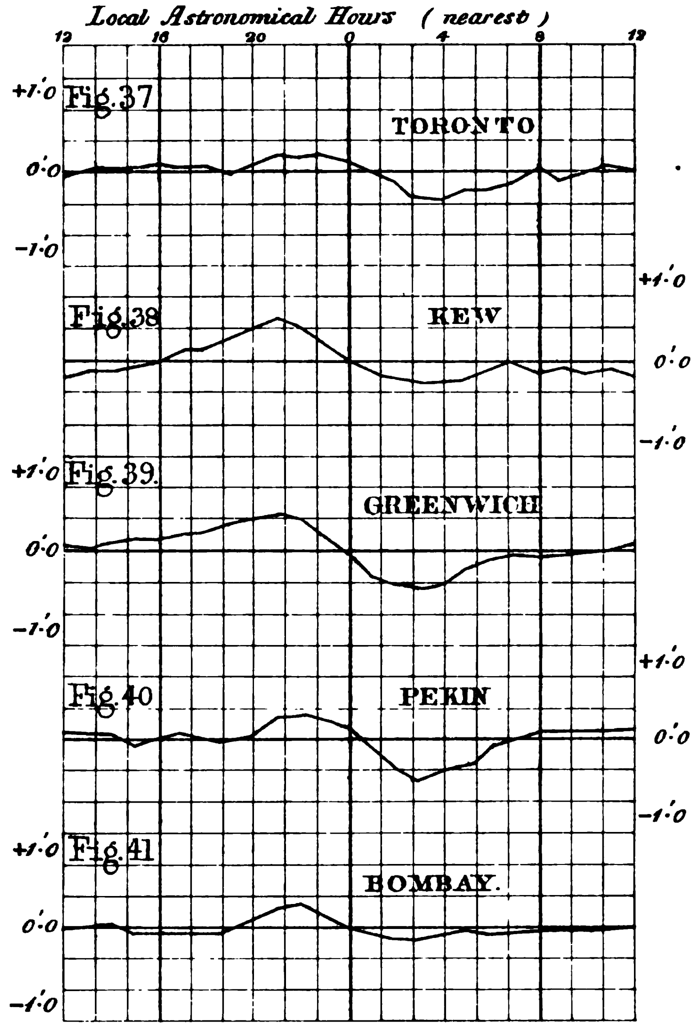
Fig. 35.

The directions OA correspond to noon of Göttingen Mean time, and the directions OA (broken lines) to noon of Bombay Mean time.

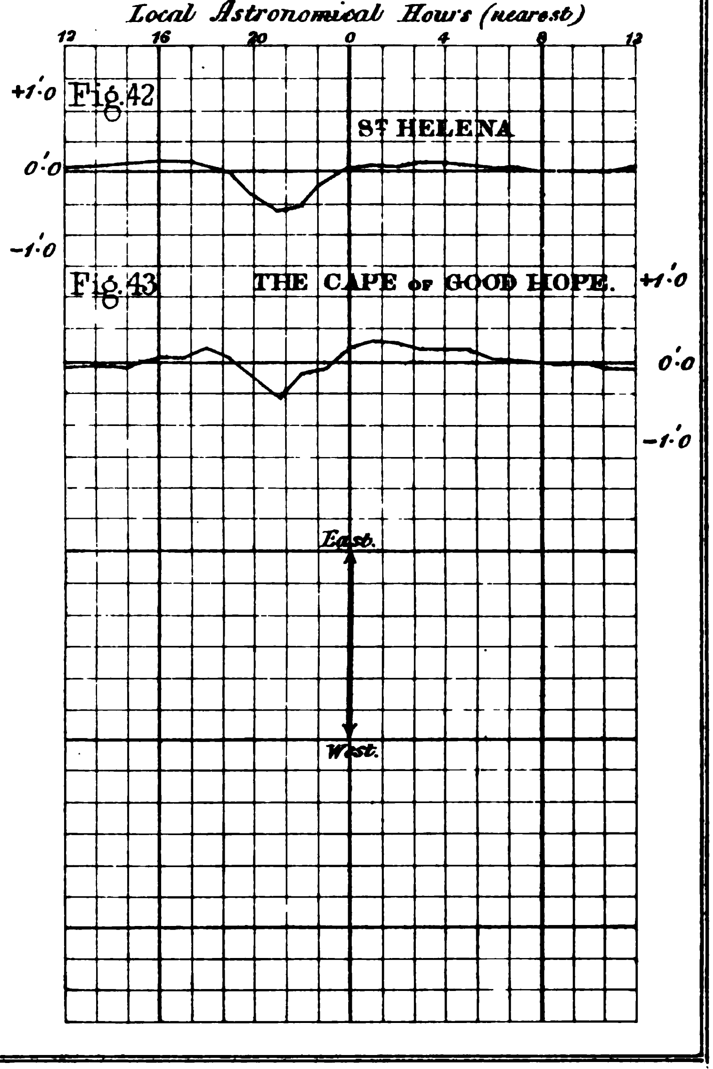
PLATE XXXV.

Excess of the Diurnal Variation of Declination for the half year January to June over the Mean Diurnal Variation for the whole year at different Stations.

North Latitude Stations.

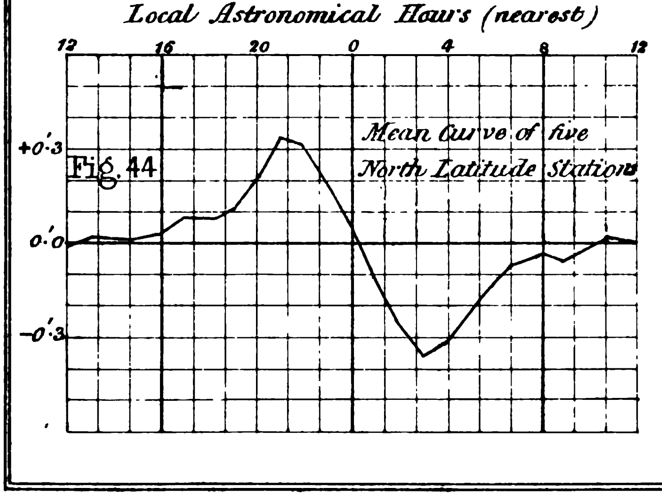


South Latitude Stations.



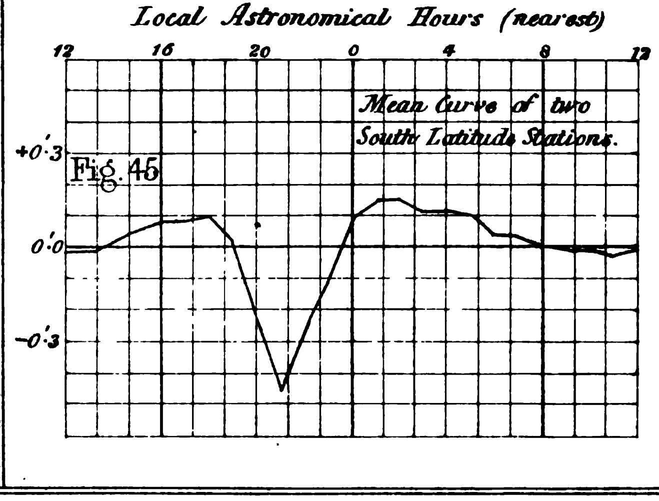
Mean for the five North Latitude Stations, of the Excess Variations represented by Figures 37 to 41.

Scale enlarged four times.



Mean for the two South Latitude Stations, of the Excess Variations represented by Figures 42 and 43.

Scale enlarged four times.



APPENDIX III.

ON THE LUNAR VARIATIONS OF MAGNETIC DECLINATION AT BOMBAY;

BEING A CONTINUATION OF APPENDIX II.

The data used for the present investigation are part of the seven years' observations (1859 to 1865) treated in the preceding paper. The complete investigation will, however, require the treatment of a much more extended series of observations, and the results now given must be regarded as preliminary only. These, which are derived from the observations of the three years 1861 to 1863, were in their present state of readiness for publication soon after the completion, in 1868, of the paper on the Solar Variations of Declination, when it became necessary to lay aside special computations and resume the reduction of the regular observations. The results arrived at are of some interest in connection with inquiries in the same direction for other places,—notably those of Dr. Neumayer, for Melbourne (which I have not however yet seen), and Dr. Bache, for Girard College Observatory in Philadelphia,—and accordingly the present opportunity is taken of giving publicity to them, partial though they be.

The method of treatment of the observations is the same as that adopted by General Sir EDWARD SABINE for those of the Colonial magnetic observatories. From the monthly tables, described in paragraph 9 of Appendix II., all observations having been thrown out which deviated from the "Final Normal" of each hour by more than 1′·4; new tables were formed in which each observation was substituted by its excess above the Final Normal of its own hour; or rather by that excess *plus* 2′·0. Practically, the Final Normal was diminished by 2′·0, and the difference being then taken between the number found and each observation in the same hour column, all the differences have the *positive* sign, and thus the inconvenience of dealing with *positive* and *negative* numbers is avoided. On the new tables the observation at the solar hour of each day which was nearest to the time of the moon's crossing the meridian of Bombay (from East to West) was marked with a figure 0 to indicate that that observation must be placed to the 0th hour of the lunar day in tables having the lunar hours from 0 to 23, marked in consecutive order at the top of the several columns. If only twenty-three observations intervened between two marked ones, they were entered in the table consecutively as forming a complete lunar day: but as twenty-four observations generally intervened, the two which were in the nearest correspondence to the same lunar hour were combined together, and the mean of the two treated as a single observation.

Sixty-four varieties of lunar tables were recognized, as shown in the following form:—

Quarter of Year.	November to January.																February to April.															
Declination of Moon.	North.				Changing from North to South.				South.				Changing from South to North.				North.				Changing from North to South.				South.				Changing from South to North			
Phase of Moon.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.
Number of Variety.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

Quarter of Year.	May to July.																August to October.															
Declination of Moon.	North.				Changing from North to South.				South.				Changing from South to North.				North.				Changing from North to South.				South.				Changing from South to North.			
Phase of Moon.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.	New.	First Qr.	Full.	Last Qr.
Number of Variety.	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64

The first tables of differences, having the hours of Göttingen mean time marked at the head of the columns, the Göttingen times of the Moon's passage from North to South or South to North declination, and of new Moon and Full Moon, were marked on the margin of the sheet opposite to the several corresponding solar days. For four days before and after these times the moon was regarded as "changing from North to South" declination; "changing from South to North" declination; as "New"; or at "Full" respectively; and during the intervening days the designations of the moon's position or phase were "South" declination; "North" declination; "First Quarter"; and "Last Quarter" respectively. The whole of a lunar day's differences were entered under that variety of position to which the greater half of the day belonged. Whenever the number of undisturbed observations on a lunar day were less than twelve, the whole day's differences were rejected. When all the differences of each category had been entered on their respective lunar tables, the hourly means were taken on these tables; and the excess was then found of each of these means above the mean of all the hours. The series of hourly excesses thus found should, in a sufficiently extended inquiry, represent the lunar diurnal variation of Declination when the sun and moon have the positions indicated by that particular table.

The cases which alone have been worked out are those when the sun and moon are together or opposed in right ascension. With these combinations only eight varieties of lunar tables are supplied with instances of occurrence during the three years, viz.—

Quarter of Year.	November to January.		February to April.		May to July.		August to October.	
Phase of Moon.	New.	Full.	New.	Full.	New.	Full.	New.	Full.
Moon's Declination.	South.	North.	Changing from South to North.	Changing from North to South.	North.	South.	Changing from North to South.	Changing from South to North.
Number of Lunar Days.	33	46	40	36	37	38	38	39
Excess of Mean Declination above Normal......	−′·082	+′·006	−′·112	+′·104	−′·001	+′·022	+′·008	+′·132

The numbers at the bottom of this form show the excess of the mean Declination in the several varieties of relative situation of the sun and moon above the mean of the assumed normals of Declination; and they make the Easterly Declination appear to be, on the average, 0′·113 greater at Full Moon than at New Moon.

The following table shows the hourly excesses found on each of the eight tables:—

Quarter of year.	Phase.	Declination.	h 0	h 1	h 2	h 3	h 4	h 5	h 6	h 7	h 8	h 9	h 10	h 11	h 12	h 13	h 14
November to January.	New.	South.	+′·104	+′·119	+′·015	+′·074	+′·026	+′·077	+′·029	−′·015	+′·006	−′·033	−′·009	−′·056	−′·072	−′·050	−′·098
Do.	Full.	North.	+·135	+·097	+·211	+·150	+·114	+·014	−·029	−·201	−·237	−·311	−·166	+·032	+·138	+·256	+·169
February to April.	New.	Changing from South to North.	+·218	+·004	−·075	−·125	−·045	−·075	−·130	−·045	−·070	−·073	−·086	+·023	+·047	+·071	+·081
Do.	Full.	Changing from North to South.	−·031	−·072	−·021	−·063	−·022	−·014	−·089	−·055	+·020	+·033	−·045	−·032	−·013	−·044	+·109
May to July	New.	North.	−·098	−·300	−·310	−·160	−·120	+·054	+·130	+·068	−·097	−·054	+·028	−·016	+·072	+·146	+·140
Do.	Full.	South.	−·038	−·080	−·025	−·146	+·055	+·057	+·038	−·050	+·035	−·022	−·072	−·232	−·125	−·073	+·124
August to October.	New.	Changing from North to South.	−·305	−·168	−·120	−·003	+·035	+·029	+·018	+·065	−·017	−·021	−·010	−·042	−·048	−·063	+·068
Do.	Full.	Changing from South to North	+·071	+·062	+·116	+·126	+·050	+·136	+·107	+·099	−·052	−·045	−·250	−·089	+·014	+·123	−·037

[*Continued.*

Quarter of Year.	Phase.	Declination.	h 15	h 16	h 17	h 18	h 19	h 20	h 21	h 22	h 23	Coefficients.					
												A_1	B_1	A_2	B_2	A_3	B_3
November to January.	New.	South.	−′·177	−′·105	−′·040	−′·187	−′·110	−′·001	+′·155	+′·184	+′·164	+·100	+·044	+·042	−·038	·000	−·036
Do.	Full.	North.	+·110	−·028	−·181	−·116	−·190	·000	+·004	+·009	+·009	+·042	−·009	+·119	+·132	−·075	−·053
February to April.	New.	Changing from South to North.	+·094	+·019	−·109	−·062	−·041	−·003	+·066	+·237	+·085	+·022	−·056	+·082	−·015	+·016	−·065
Do.	Full.	Changing from North to South.	+·019	+·008	−·056	+·010	+·059	+·019	+·057	+·059	+·164	+·009	−·037	+·012	−·023	+·005	−·026
May to July.	New.	North.	+·177	+·123	+·046	+·115	+·186	+·054	+·081	−·117	−·159	−·117	−·083	−·081	−·009	−·037	−·066
Do.	Full.	South.	+·258	+·184	+·106	+·176	−·042	−·029	−·042	−·064	−·003	−·019	−·055	−·076	+·062	+·064	−·035
August to October.	New.	Changing from North to South.	−·025	+·334	+·124	+·172	+·252	+·077	+·059	−·093	−·321	−·072	−·061	−·146	+·019	−·038	+·028
Do.	Full.	Changing from South to North.	−·019	+·059	−·078	−·074	−·096	−·056	−·032	−·084	−·040	+·026	+·053	+·002	+·076	+·003	−·039

The last six columns show the values of the coefficients, derived from the respective sets of hourly excesses, in the series.

$$\delta_\theta = A_1 \cos\theta + B_1 \sin\theta + A_2 \cos 2\theta + B_2 \sin 2\theta + \&c.$$

in which θ represents the hour angle and δ_θ the excess for the corresponding hour.

Curves have been constructed, in the usual manner, to represent these variations, and appear, as figs. 1 to 8, on Plate XXXVI. They are all of systematic character, but extremely unlike each other, both in the character of the inflections of the curves and in the times of occurrence of maxima and minima. Were it not unsafe to generalize from the results of so limited a body of observations, it would readily be inferred that the *mean* lunar diurnal variation, which is found by the combination of these and other distinct varieties of lunar diurnal variation, represents generally but a residual part of the moon's actual magnetic action in its several varieties of position. The principal feature—the double period—of the usual lunar diurnal variation is, however, plainly marked on six out of the eight curves.

The number of observations being insufficient to lead to satisfactory conclusions as to the nature of the lunar diurnal variation for each of the sixty-four varieties of position named above, the whole body of three years' observations has also been combined differently in three ways: first, in separate years, forming three groups; secondly, with regard to the declination of the sun and moon, forming four groups; and thirdly, with regard to the declination of the sun, and phase of the moon, forming eight groups. The following statement shows what observations were included in each group, and also what combinations of the hourly means of the several groups were made to exhibit more clearly the relation between the several variations.

Group I. includes every lunar day in the year 1861.
„ II. do. do. 1862.
„ III. do. do. 1863.
„ IV. do. in the three years 1861 to 1863.
„ V. do. on which the moon had North declination, in the months April to September.
„ VI. do. do. do. do. do. January to March and October to December.
„ VII. do. do. do. do. do. in the whole period.
„ VIII. do. on which the moon had South declination, in the months April to September.
„ IX. do. do. do. do. do. January to March and October to December.
„ X. do. do. do. do. do. in the whole period.
„ XI. includes four days before and four days after every new moon, in the months April to September.
„ XII. do. do. do. do. do. January to March and October to December.
„ XIII. do. do. do. do. do. in the whole period;

and Groups XIV., XV., and XVI.; XVII, XVIII., and XIX; and XX., XXI., and XXII.; correspond to Groups XI., XII., and XIII., but having reference to the phases of the moon—First Quarter, Full Moon, and Last Quarter respectively; the First and Last Quarters including the lunar days which intervene between those abstracted for the New Moon, and Full Moon tables.

The half-excesses of the corresponding hourly mean numbers in Group V. above those in Group VI. were taken to show separately the semi-annual inequality in the lunar diurnal variation when the moon has North declination; similarly with Groups VIII. and IX., XI. and XII., &c., to show the semi-annual inequality of the respective variations.

[TABLE

The excesses of the several hourly means above the mean of

Group.	Year, Half-year, or Period.	Moon's Declination or Phase.	BOMBAY LUNAR												
			h 0	h 1	h 2	h 3	h 4	h 5	h 6	h 7	h 8	h 9	h 10	h 11	h 12
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
			′	′	′	′	′	′	′	′	′	′	′	′	′
I.	1861.		−·007	+·020	·000	−·008	+·015	+·020	+·022	+·053	+·025	−·009	−·044	−·047	−·026
II.	1862.		+·044	−·004	+·023	+·010	+·013	+·037	·000	+·020	−·040	−·075	−·061	−·048	−·028
III.	1863.		−·008	+·005	+·018	−·040	−·010	−·029	−·034	−·034	−·049	−·034	−·007	+·008	−·014
IV.	1861 to 1863.		+·011	+·007	+·015	−·012	+·006	+·009	−·005	+·013	−·023	−·040	−·037	−·029	−·023
V.	Apr. to Sep.	North.	−·139	−·135	−·081	−·034	+·031	+·053	+·041	+·024	−·053	−·057	−·007	−·004	−·001
VI.	Oct. to Mar.	Do.	+·105	+·104	+·081	+·073	+·014	−·006	−·035	−·040	−·093	−·032	−·019	+·004	+·014
VII.	Mean of V. and VI.	Do.	−·017	−·016	·000	+·019	+·023	+·024	+·004	−·008	−·072	−·045	−·013	·000	+·007
VIII.	Apr. to Sep.	South.	+·010	−·028	−·005	−·033	+·026	+·009	−·013	+·053	+·068	−·053	−·089	−·114	−·133
IX.	Oct. to Mar.	Do.	+·080	+·103	+·073	−·069	−·063	−·030	−·021	+·017	+·003	−·016	−·040	−·009	+·018
X.	Mean of VIII. and IX.	Do.	+·043	+·033	+·031	−·048	−·014	−·008	−·016	+·036	+·037	−·035	−·065	−·062	−·057
XI.	Apr. to Sep.	New.	−·207	−·248	−·137	−·031	+·014	+·075	+·028	+·005	−·048	−·033	+·001	+·045	+·039
XII.	Oct. to Mar.	Do.	+·129	+·082	+·019	−·031	−·035	−·038	−·094	−·028	·000	−·035	−·034	−·005	−·014
XIII.	Mean of XI. and XII.	Do.	−·041	+·088	−·062	−·032	−·011	+·020	−·031	−·011	−·026	−·035	−·017	+·020	+·012
XIV.	Apr. to Sep.	First Qr.	−·036	+·058	+·077	+·063	+·032	+·004	−·037	−·015	−·031	−·078	−·003	−·118	−·173
XV.	Oct. to Mar.	Do.	+·087	+·077	+·144	+·029	−·029	−·022	+·013	+·028	−·012	−·016	−·021	−·056	−·002
XVI.	Mean of XIV. and XV.	Do.	+·027	+·069	+·112	+·048	+·004	−·007	−·011	+·008	−·019	−·046	−·010	−·086	−·085
XVII.	Apr. to Sep.	Full.	+·024	−·053	+·011	−·056	−·020	−·014	+·003	+·080	+·023	−·080	−·176	−·120	−·073
XVIII.	Oct. to Mar.	Do.	+·118	+·131	+·150	+·100	+·075	+·020	−·040	−·122	−·140	−·088	−·100	−·015	−·001
XIX.	Mean of XVII & XVIII.	Do.	+·070	+·036	+·074	+·019	+·027	+·003	−·017	−·019	−·057	−·084	−·138	−·067	−·036
XX.	Apr. to Sep.	Last Qr.	−·038	−·035	−·074	−·047	+·102	+·092	+·126	+·080	+·045	−·072	−·094	−·047	−·043
XXI.	Oct. to Mar.	Do.	+·072	+·052	+·082	+·030	−·133	−·059	−·033	−·005	−·006	+·063	+·078	+·068	+·066
XXII.	Mean of XX. and XXI.	Do.	+·013	+·006	+·001	−·011	−·009	+·021	+·051	+·039	+·021	−·009	−·015	+·008	+·009
Mean.	1861 to 1863.		−·081	−·094	−·062	+·022	+·023	+·024	+·021	+·025	+·025	−·016	−·009	−·027	−·039
Half of (V. minus VI.)	....	North.	−·122	−·120	−·081	−·054	+·008	+·029	+·037	+·031	+·019	−·013	+·006	−·004	−·008
Half of (VIII. minus IX.)	....	South.	−·035	−·065	−·039	+·018	+·044	+·019	+·004	+·018	+·032	−·018	−·024	−·052	−·075
Half of (XI. minus XII.)	....	New.	−·168	−·165	−·078	·000	+·024	+·056	+·061	+·016	−·024	+·001	+·017	+·025	+·026
Half of (XIV. minus XV.)	....	First Qr.	−·061	−·009	−·033	+·017	+·030	+·013	−·025	−·021	−·009	−·031	+·009	−·031	−·085
Half of (XVII. min. XVIII.)	....	Full.	−·046	−·091	−·069	−·077	−·047	−·016	+·022	+·101	+·082	+·004	−·037	−·052	−·035
Half of (XX. minus XXI.)	....	Last Qr.	−·054	−·043	−·077	−·038	+·118	+·076	+·080	+·043	+·026	−·067	−·085	−·057	−·054

Columns 1 to 27 need no further explanation; column 28 shows the excess of the Absolute Declination for each position of the moon above the respective means of the assumed normals of Declination; and columns 29 to 34 show the coefficients of the series (*y*) (See Appendix II. paragraph 14), which is a convenient and suggestive form in which to express the variations and for which the coefficients have been calculated in the case of every independent group.

Curves have been constructed to represent the variations otherwise expressed by the hourly excesses of the following groups, viz.:—IV., VII., X., XIII., XVI., XIX., XXII., and of all the seven semi-annual inequality combinations: they are marked respectively figures 9 to 22 on Plate XXXVII.

all the hours, for the several groups, are as follows:—

Hours.											Excess of mean Declination for 24 hours above normal.						
h 13	h 14	h 15	h 16	h 17	h 18	h 19	h 20	h 21	h 22	h 23		A_1	B_1	A_2	B_2	A_3	B_3
17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′	′
+·001	−·006	+·039	+·038	−·004	+·010	+·008	−·026	−·049	−·008	−·017	+·002	·000	+·007	−·019	+·016	+·017	−·009
+·007	+·060	+·020	+·001	−·005	−·007	−·037	−·016	+·042	+·021	+·028	−·003	+·022	−·007	+·003	+·022	+·001	−·029
+·012	+·087	+·082	+·072	+·033	−·006	−·040	−·044	+·022	−·002	+·006	−·001	−·013	−·027	+·014	+·027	+·014	−·011
+·007	+·049	+·047	+·036	+·008	−·001	−·024	−·028	+·008	+·004	+·007	−·001	+·003	−·009	·000	+·022	+·011	−·017
+·056	+·111	+·049	+·051	+·056	+·050	+·074	+·045	+·012	−·050	−·088	−·018	−·047	−·031	−·051	+·019	−·036	−·024
+·057	+·102	+·070	−·052	−·121	−·107	−·154	−·083	+·021	+·027	+·059	+·015	+·024	+·023	+·078	+·042	+·004	−·028
+·056	+·107	+·060	+·001	−·031	−·028	−·042	−·019	+·017	−·011	−·013	−·002	−·012	−·004	+·013	+·031	−·016	−·026
−·109	−·024	+·065	+·140	+·141	+·108	+·063	−·015	−·027	−·029	−·005	+·012	+·018	−·033	−·071	+·025	+·051	+·006
+·010	−·013	−·006	+·012	−·030	−·053	−·077	−·068	+·023	+·078	+·066	−·012	+·024	+·003	+·043	−·002	+·034	−·016
−·051	−·018	+·031	+·078	+·056	+·022	−·003	−·039	−·003	+·022	+·029	·000	+·020	−·015	−·015	+·012	+·041	−·005
+·074	+·086	+·093	+·087	+·075	+·113	+·157	+·072	+·035	−·083	−·217	−·018	−·088	−·052	−·084	+·012	−·064	−·010
+·014	+·001	−·039	−·073	−·089	−·097	−·062	−·031	+·080	+·208	+·175	−·082	+·059	−·006	+·074	−·031	+·018	−·037
+·043	+·043	+·028	+·010	−·005	+·014	+·052	+·022	+·055	+·062	−·021	−·048	−·015	−·030	−·007	−·009	−·024	−·023
−·185	−·099	−·017	+·072	+·114	+·173	+·157	+·097	+·005	−·031	−·024	+·013	+·064	−·041	−·076	+·013	+·011	+·060
+·025	+·160	+·199	+·046	−·077	−·143	−·160	−·192	−·068	−·043	+·029	+·039	−·011	+·033	+·058	+·075	+·058	−·039
−·079	+·031	+·093	+·061	+·015	+·007	−·009	−·053	−·030	−·035	+·006	+·024	+·026	−·001	−·007	+·045	+·035	+·010
−·067	+·046	+·151	+·190	+·136	+·124	+·019	−·021	−·051	−·065	−·019	+·069	−·003	−·051	−·064	+·054	+·059	−·016
+·091	+·083	+·041	−·030	−·114	−·055	−·105	−·051	+·016	+·006	+·025	+·038	+·050	+·008	+·069	+·073	−·020	−·014
+·012	+·065	+·098	+·082	+·011	+·035	−·042	−·035	−·017	−·030	+·003	+·053	+·022	−·022	+·002	+·063	+·020	−·016
+·038	−·007	−·055	−·018	+·012	−·011	−·021	−·024	+·040	+·023	+·039	−·077	+·014	+·022	−·039	·000	−·009	−·053
+·065	−·008	−·014	−·025	−·016	−·059	−·164	−·080	−·007	+·023	−·002	−·054	−·017	+·023	+·067	−·004	+·024	+·013
+·050	−·008	−·036	−·022	−·001	−·034	−·089	−·050	+·018	+·023	+·020	−·066	−·001	+·023	+·011	−·002	+·006	−·022
−·029	−·001	+·010	+·056	+·086	+·079	+·093	+·045	−·015	−·045	−·055		−·019	−·022	−·060	+·001	−·006	+·006
−·001	+·004	−·011	+·051	+·088	+·078	+·113	+·063	−·005	−·039	−·074		−·035	−·027	−·064	−·011	−·020	+·002
−·059	−·006	+·035	+·064	+·085	+·080	+·070	+·026	−·025	−·053	−·035		−·003	−·018	−·057	+·013	+·008	+·011
+·030	+·042	+·066	+·080	+·082	+·105	+·109	+·051	−·023	−·145	−·196		−·073	−·023	−·079	+·021	−·041	+·013
−·105	−·129	−·108	+·013	+·095	+·158	+·158	+·144	+·036	+·006	−·026		+·037	−·037	−·067	−·031	−·023	+·048
−·078	−·018	+·055	+·110	+·125	+·090	+·062	+·015	−·033	−·035	−·021		−·026	−·029	−·066	−·009	+·039	−·001
−·013	+·001	−·020	+·004	+·014	+·024	+·072	+·028	+·024	+·001	+·003		+·015	·000	−·055	+·002	−·016	−·033

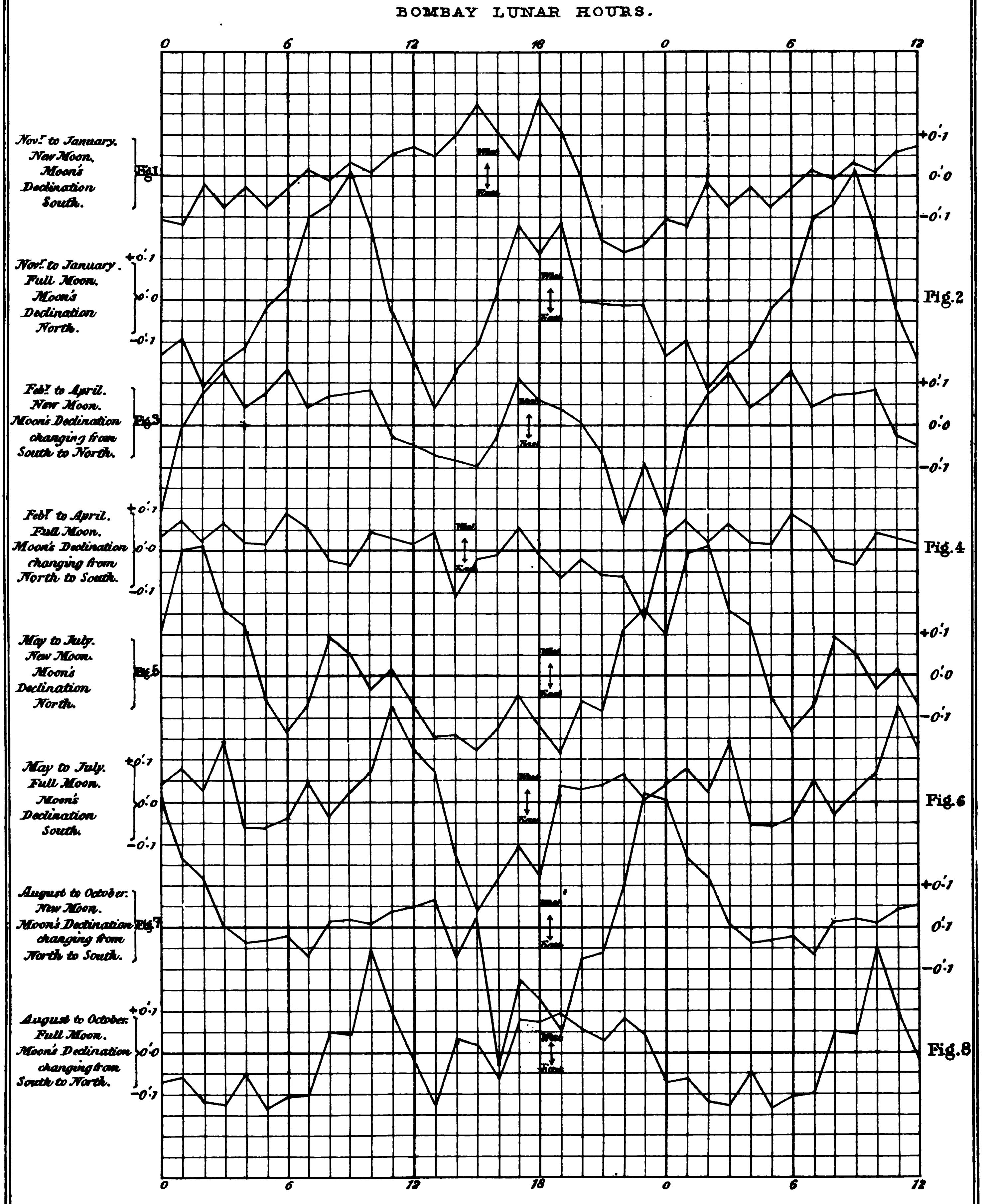
The usual definite character of the mean lunar diurnal variation (fig. 9) is very well marked although its whole range is less than *six seconds* of arc. Its semi-annual inequality, shown by fig. 16, which is equally well marked but of quite different character, as regards the phase of its inflections, has moreover a range of twice that extent. This semi-annual inequality appears, from figs. 17 and 18, to be of the same character whether the moon has north or south declination: but whilst, under each of the different phases of the moon, its general features are still preserved, there are marked modifications of form in its curves at New Moon and First Quarter; and the latter of these, if inverted and advanced in phase by five hours, bears a remarkably close resemblance to the former: and this resemblance shows itself, it must be remarked, in curves constructed from perfectly independent series of observations. The operations described have been performed, producing a dotted curve on the same scale with fig. 19. The curves (figs. 10 and 11) of lunar diurnal variation, when the moon has north and south declination respectively, are more marked by their differences than by their resemblances: and the same may be said of the several phase curves (figs. 12 to 15) with the exception of the First Quarter and Full Moon curves, which are not unlike: in these latter there is no general indication of a periodical rotation of phase of the curves; although it is possible that a more extended investigation may show something of the kind.

The numbers in column 28 make the Absolute Declination appear to be ′·014 greater than the normal when the sun and moon are opposed in declination; and ′·015 less than the normal when they are together in declination. And at New Moon, First Quarter, Full Moon, and Last Quarter, the respective relations of the Absolute Declination to the normal are ′·048 below, ′·024 above, ′·053 above and ′·066 below. The reason why the sum of these four numbers is not *zero*, is that the rule of attributing eight full lunar days to New Moon and Full Moon, in each lunation, makes an unequal distribution of the observations amongst the four quarters; the rule should have been seven days instead of eight.

PLATE XXXVI.

LUNAR DIURNAL VARIATION OF DECLINATION

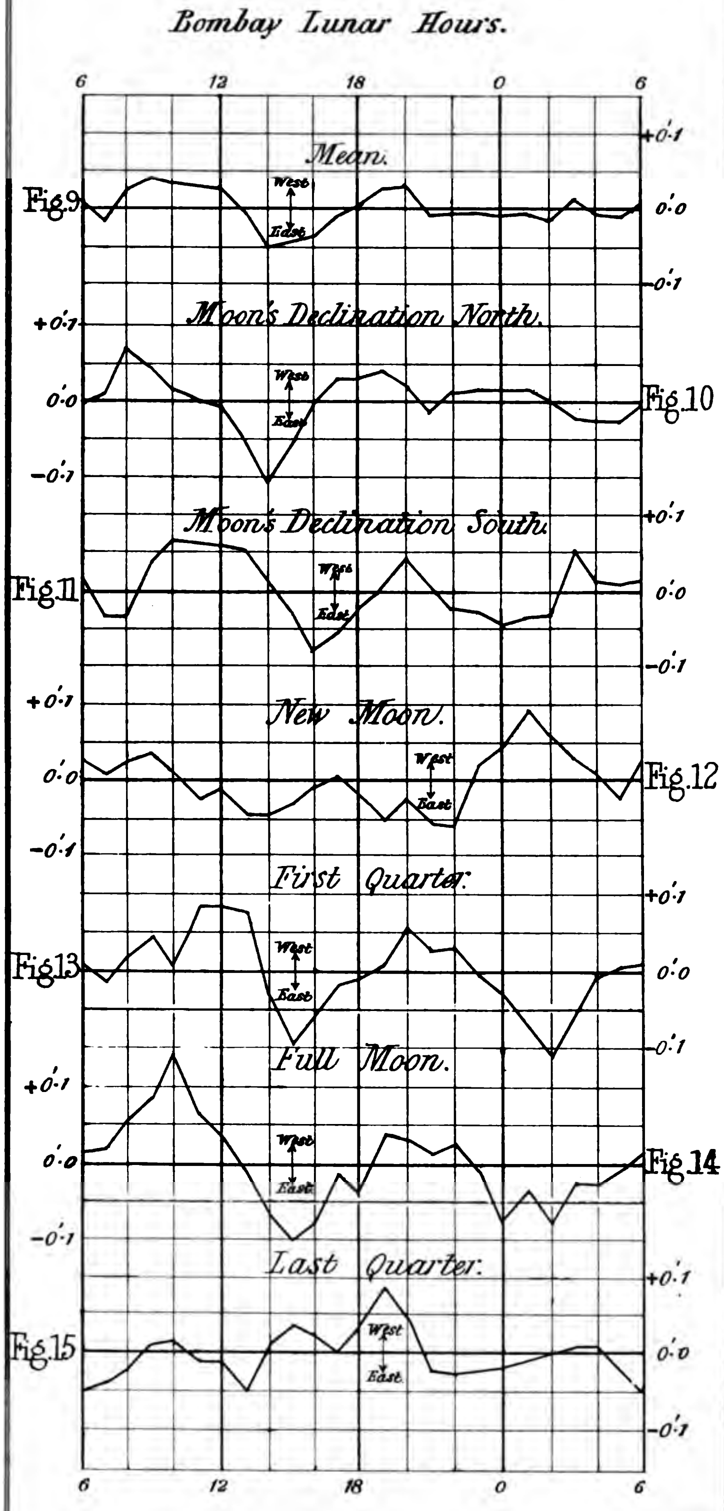
under different relative Positions of the Sun & Moon.



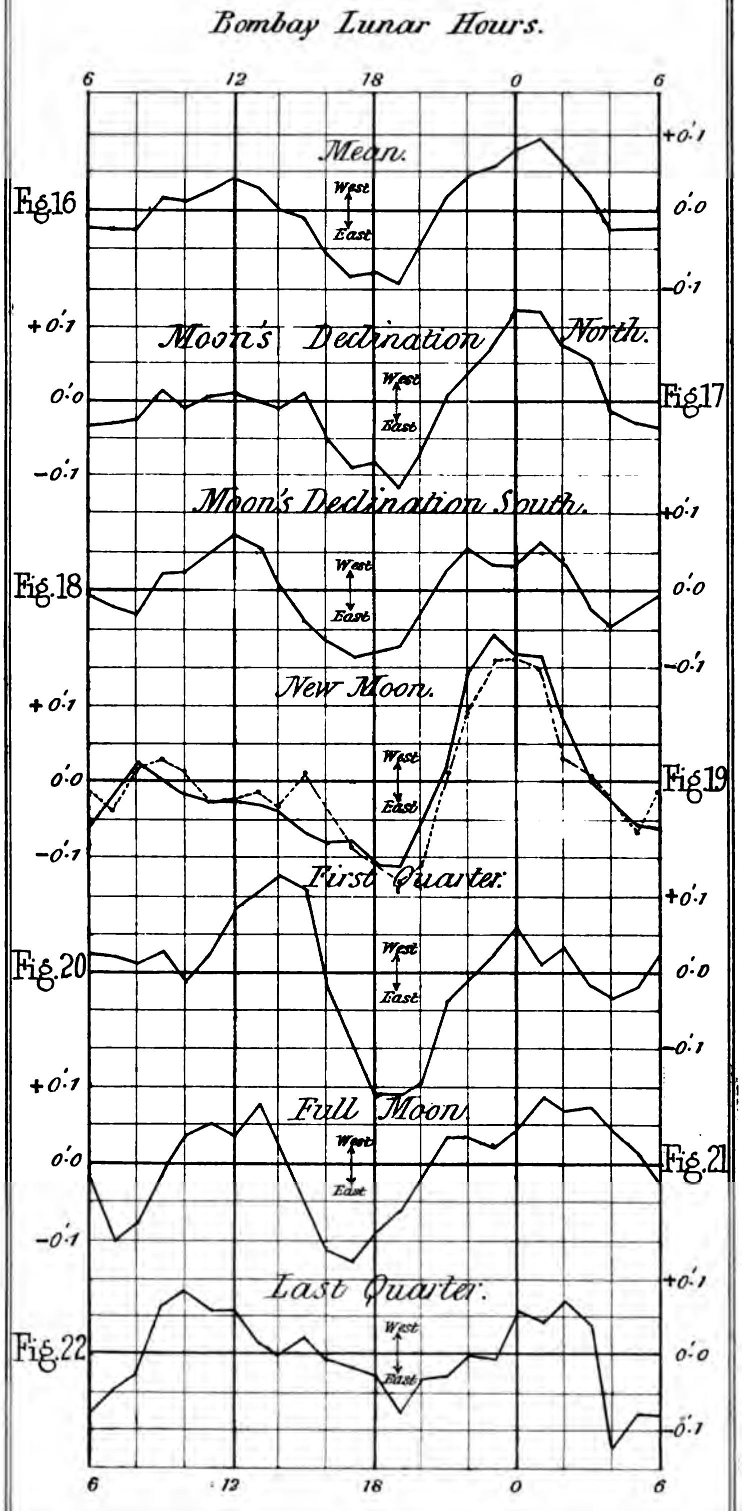
Increasing ordinates denote decreasing Easterly Declination.

PLATE XXXVII.

Lunar Diurnal Variation of Declination.



Semi-Annual Inequality of the Lunar Diurnal Variation of Declination.



Increasing ordinates denote decreasing Easterly Declination.

APPENDIX IV.

THE ABSOLUTE DIRECTION AND INTENSITY OF THE EARTH'S MAGNETIC FORCE AT BOMBAY;

AND ITS SECULAR AND ANNUAL VARIATIONS.

Data for Investigation.—The observations made use of for this investigation are all contained in the Tables in this volume, and comprise,—

The monthly means of the determinations of Dip from April 1867 to March 1870, taken from Tables XVIII. to XXI.

The monthly means of the determinations of Declination from July 1867 to December 1870, taken from Tables XIV. to XVII. ; and

The monthly means of the determinations of Horizontal Intensity from July 1867 to December 1870, taken from Tables X. to XIII.

I.—Dip.

2. *Monthly Mean Values.*—The following table shows the monthly mean values of the Dip for each year:—

TABLE 1.

Year.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
	19°+	19°+	19°+	19°+	19°+	19°+	19°+	19°+	19°+	19°+	19°+	19°+
1867-68	1′·1	1′·9	1′5	0′·8	2′·2	2′·5	2′·5	2′·8	2′·7	2′·7	3′4	3′·8
1868-69	4·1	4·1	4·3	4·3	4·2	4·3	4·2	3·6	3·5	3·7	4·8	5·2
1869-70	6·0	6·2	6·3	6·8	6·4	5·7	6·2	6·5	5·6	5·6	5·8	6·0

3. *Annual Mean Values and Secular Change.*—The annual mean values and yearly increments are as follows:—

TABLE 2.

Year.	Mean Dip.	Annual Increase of Dip.
1867-68	19° 2′·3	
1868-69	19 4·2	+1′·9
1869-70	19 6·1	+1·9
Mean Dip for three years	19 4·2	......

The two yearly differences agree in making the annual secular change of dip a steady increase of 1′·9; hence the mean dip for the three years 19° 4′·2 will properly correspond to the mean epoch, which is the 1st October 1868.

4. *Annual Variation.*—The average monthly values of dip for the period of three years, shown below, are affected by secular change: this is eliminated, on the assumption that the

change is uniform from month to month, by subtracting from the values for the months May to March respectively once, twice, thrice, &c., the monthly secular increase (0′·16):—

TABLE 3.

Month.		April.	May.	June.	July.	August	September.	October.	November.	December.	January.	February.	March.
Mean Monthly Dip for period of three years.	19° +	3′·7	4′·1	4′·0	4′·0	4′·3	4′·2	4′·3	4′·3	3′·9	4′·0	4′·7	5′·0
Correction for secular change, to April 15, 1868		0	−·2	−·3	−·5	−·6	−·8	−1·0	−1·1	−1·3	−1·4	−1·6	−1·8
Monthly values cleared of secular change ...	19° +	3·7	3·9	3·7	3·5	3·7	3·4	3·3	3·2	2·6	2·6	3·1	3·2

The means of different groups of the monthly values thus cleared of secular change, but affected by the annual variation of Dip, are—

	°	′
For April to September	19	3·6
„ October to March	19	3·0
„ May to August	19	3·7
„ March, April, September and October ...	19	3·4
„ November to February	19	2·9

Corrected for secular change to epoch April 15, 1868—

which all agree in indicating an annual variation, in which the dip is a maximum when the sun is about its most northerly position in Declination, a minimum when the sun is about its most southerly position, and having intermediate values when the sun is near the equator. The semi-annual excess of dip when the sun has north Declination above the mean value for the year is 0′·3.

5. *Diurnal Inequality at observation hours.*—The difference between the morning and afternoon observations is almost inappreciable, as will be seen by the following statement, which embraces every observation in 1867 and 1868, finished before 15 hours or commenced after 15 hours for every month in which observations of both kinds are recorded: the general result is a slight excess of dip in the afternoon:—

Period.	Needle No.	Number of Observations.	Mean Time of Observation.				Mean Dip.	Excess of Afternoon over Morning.
			First half.		Last half.			
			Commencement.	Conclusion.	Commencement.	Conclusion.		
			h. m.	h. m.	h. m.	h. m.	° ′	′
1867, June to Dec....	1	17	10 22	10 56	11 4	11 47	19 1·0	+0·3
Do.	1	13	15 20	15 50	16 5	16 38	19 1·3	
Do.	2	15	10 23	10 58	11 19	11 50	19 3·3	0·0
Do.	2	15	15 26	15 55	16 11	16 41	19 3·3	
1868, Jan. to Dec....	1	26	10 25	10 49	10 59	11 25	19 3·2	+0·1
Do.	1	26	15 24	15 51	16 0	16 25	19 3·3	
Do.	2	27	10 18	10 44	10 54	11 21	19 4·4	+0·1
Do.	2	25	15 24	15 49	15 59	16 24	19 4·5	

From this it may be inferred that the annual variation of the diurnal inequality of dip for the mean observation hour—or rather the mean variation for the morning and afternoon hours —is also probably small, and may scarcely affect sensibly the annual variation of Dip found above; this latter variation must, however, be accepted subject to correction, if necessary, when the annual variation of the diurnal inequality of Dip has been well determined.

6. *Probable error.*—It will suffice to give an idea of the quality of the observations of Dip if an account be here given of the results of determinations made early in 1869, of the probable error of a single weekly determination (being the mean of a pair of observations) in three distinct periods in 1867 and 1868. The semi-annual inequality found by a similar process to that described above, from this more limited body of observations was the same as that found above from three years' observations, viz., an excess of 0'·3 in the Dip from April to September above the mean of the year; and an equal defect during the opposite half year. The annual secular increase of Dip was found to be 1'·3. These values were embodied in formulæ for correcting the observed weekly values of Dip to a common epoch as follows:—

From April 29 to August 16, 1867

$$\theta = \theta' - 0'{\cdot}1\,m$$

m being the excess (in months) of the date over June 15, 1867.

From August 23 to September 27, 1867

$$\theta = \theta' - 0'{\cdot}1\,m - 0'{\cdot}3$$

From October 1 to December 3, 1867

$$\theta = \theta' - 0'{\cdot}1\,m + 0'{\cdot}3$$

m being the excess of the date (in months) over October 15, 1867.

From January 1 to March 31, and from October 1 to December 31, 1868

$$\theta = \theta' - 0'{\cdot}1\,m + 0'{\cdot}3$$

And from April 1 to September 30, 1868

$$\theta = \theta' - 0'{\cdot}1\,m - 0'{\cdot}3$$

m being the excess of the date (in months) over July 15, 1868.

θ in every case representing the Dip at the common epoch of the period, and θ' the observed Dip.

The weekly values of Dip being thus corrected, the differences were taken between them and the mean of all the corrected values in each period, and to these differences the method of least squares was applied to find the probable errors for the several periods: these are—

For April 29 to August 16, 1867 the probable error = ± 0'·67
„ August 23 to December 31, 1867 do. ...... = ± 0·26
„ January 1 to December 31, 1868 do. ...... = ± 0·24

The remaining observations—of 1869 and 1870—being of about the same quality as those of 1868 will have about the same probable error.

The unusual smallness of the probable error of a weekly determination since August 17, 1867, is attributable mainly I think to the comparative infrequency and moderate amount of disturbance at a low latitude station, but partly also to the extreme care that has been given to secure the perfect preservation of the axles of the needles: the needles themselves also appear to be of excellent character.

7. *Differences with different needles.*—The mean dip observed with needle No. 2 has, at different periods, exceeded that observed with needle No. 1 as shown below:—

Period.	Excess of Dip with Needle No. 2 over that with Needle No. 1.	
	Morning observations.	Afternoon observations.
1867, June to August	+ 5'·0	+ 5'·0
„ September to December	+ 0·3	− 0·2
1868, January to December	+ 1·2	+ 1·2

It is noticeable that the great change between the two first periods is contemporaneous with the introduction of the practice of remagnetizing the needle before commencing an observation.

II.—Declination.

8. *Monthly Mean Values.*—In Table 4 are collected the monthly means of the values of Absolute Declination, as observed, from July 1867 to December 1870, and the corresponding mean readings of the Large Declination Magnetometer: and in Table 5 are shown the same mean values of Declination, corrected for the difference between the corresponding mean readings of the Large Declination Magnetometer and the mean readings of that instrument—also given with the same table—for the respective months; the corrected values thus obtained showing the mean Declination of the several months. The adopted value of a unit of the scale of the Large Declination Magnetometer is 6′49″·5—increasing readings denoting increasing Easterly Declination.

TABLE 4.

Month.	Mean observed Declination.				Corresponding Mean Scale Reading of Large Declination Magnetometer.			
	1867.	1868.	1869.	1870.	1867.	1868.	1869.	1870.
	′ ″	′ ″	′ ″	′ ″				
January …………		44 16	46 15	47 9		35·25	35·55	35·70
February …………		44 2	46 56	47 4		35·30	35·54	35·73
March …………		44 56	46 22	48 4		35·32	35·46	35·88
April …………		43 19	45 7	46 36		35·12	35·28	35·64
May …………		42 27	45 26	47 0		35·12	35·38	35·67
June …………		42 24	45 38	46 54		35·07	35·38	35·63
July …………	41 34	43 24	45 57	47 17	34·86	35·25	35·47	35·66
August …………	41 15	43 39	45 16	46 43	34·80	35·21	35·38	35·62
September…………	41 20	42 31	45 15	47 23	34·78	35·14	35·46	35·70
October …………	42 18	44 51	46 29	49 15	34·92	35·47	35·62	36·02
November …………	43 38	46 4	47 13	49 47	35·08	35·59	35·73	36·17
December …………	43 58	45 34	47 43	50 7	35·19	35·44	35·74	36·22

TABLE 5.

Month.	Mean Monthly Declination reduced to Mean Monthly Reading of the Large Declination Magnetometer.				Mean Monthly Reading of Large Declination Magnetometer.			
	1867.	1868.	1869.	1870.	1867.	1868.	1869.	1870.
	′ ″	′ ″	′ ″	′ ″				
January…………		44 8	45 55	48 27		35·23	35·50	35·89
February …………		43 54	47 0	48 14		35·28	35·55	35·90
March …………		44 52	47 15	48 33		35·31	35·59	35·95
April…………		45 14	47 30	48 55		35·40	35·63	35·98
May …………		44 26	47 37	48 51		35·41	35·70	35·94
June …………		44 43	47 49	48 57		35·41	35·70	35·93
July …………	43 16	44 38	47 23	49 16	35·11	35·43	35·68	35·95
August …………	43 6	45 38	47 47	49 39	35·07	35·50	35·75	36·05
September …………	43 35	45 31	47 38	50 35	35·11	35·58	35·81	36·17
October…………	43 56	46 1	47 47	50 37	35·16	35·64	35·81	36·22
November…………	44 19	45 56	47 50	50 7	35·18	35·57	35·82	36·22
December…………	43 58	45 42	48 20	50 8	35·19	35·46	35·83	36·21

9. *Annual Mean Values, and Secular Change.*—Table 6 shows the Absolute Declination, both as observed, and corrected as in Table 5, for each year from 1867 to 1870, and also the respective annual increments of Declination and the mean annual increment for the period of three and a half years.

TABLE 6.

Year.	Absolute Declination and Annual Increments.			
	As observed.		Corrected to mean Reading of Large Declination Magnetometer.	
	Declination.	Annual Increment.	Declination.	Annual Increment.
	′ ″	′ ″	′ ″	′ ″
1867, July to December	42 20	[+2 0]	43 42	[+1 52]
1868, July to December	44 20		45 34	
1868, January to December ...	43 57	+2 11	45 4	+2 25
1869, January to December ...	46 8	+1 39	47 29	+1 52
1870, January to December ...	47 47		49 21	
Mean for 3½ years	45 26	+1 56	46 47	+2 5

The values 45′ 26″ and 46′ 47″ of Absolute Easterly Declination, as observed and as corrected, correspond to the mean epoch April 1, 1869; the annual increase of Declination (1′56″ or 2′ 5″) differs by only 9″ whether it is derived directly from the observations or from the observations corrected. In calculating the means only half weight has been given to the values in brackets which are derived from only half as many observations as the other values.

10. *Secular Change at different heights above the ground.*—In the following table the annual increments of Declination, as derived from the absolute observations, are compared with the corresponding increments, derived from the annual mean readings of the Large Declination Magnetometer.

TABLE 7.

Year.	Reduced Readings of Large Declination Magnetometer.			Annual increment derived from Absolute Observations.
	Mean.	Annual Increment.	Annual Increment corrected.	
1859.	21·451	2·544		
1860.	23·995			
1861.				
1862.	30·502	3·458	3′·441	
1863.	33·960	2·493	2·481	
1864.	36·453	3·575	2·557	
1865.	40·028	4·108	4·087	
1866.	44·136	2·573	2·560	
1867.	46·709	2·426	2·414	[1′·87]
1868.	49·135	1·799	1·790	2·42
1869.	50·934	2·312	2·300	1·87
1870.	53·246			

11. The numbers in column 4 bear the same ratio to those in column 3 as the adopted value (6′·841) bears to the true value (6′·806) of the scale coefficient of the Large Declination Magnetometer.

Two of the three annual increments derived from the readings of the Declinometer are considerably greater than the corresponding increments derived from the absolute observations; and in the remaining case there is reason to believe that the defect in the Declinometer difference is due to a minute but sensible permanent local change of Declination; for between the 9th of November and 16th December 1868 the excavation for the new magnetograph room removed a large mass of sensibly magnetic rock from the immediate neighbourhood of the Magnetic Observatory, and the monthly mean readings of the Declinometer show changes as follows:—

TABLE 8.

July 1867 to July 1868.	August 1867 to August 1868.	Sept. 1867 to Sept. 1868.	Oct. 1867 to Oct. 1868.	Nov. 1867 to Nov. 1868.	Dec. 1867 to Dec. 1868.	Jan. 1868 to Jan. 1869.	Feb. 1868 to Feb. 1869.	March 1868 to March 1869.	April 1868 to April 1869.
+·361	+·394	+·427	+·463	+·382	+·375	+·267	+·269	+·281	+·221

+·411 +·260

Showing a mean change of —·151 —equivalent to 1′·031.

TABLE 9.

July 1868 to July 1869.	August 1868 to August 1869.	Sept. 1868 to Sept. 1869.	Oct. 1868 to Oct. 1869.	Nov. 1868 to Nov. 1869.	Dec. 1868 to Dec. 1869.	Jan. 1869 to Jan. 1870.	Feb. 1869 to Feb. 1870.	March 1869 to March 1870.	April 1869 to April 1870.
+·252	+·248	+·232	+·170	+·245	+·377	+·388	+·349	+·356	+·354

225 +·362

Showing a mean change of + ·137—equivalent to 0′·940.

The two sets of differences agree in pointing to a permanent diminution of scale reading of about one minute in extent, simultaneously with the excavation of the magnetograph room in November and December 1868. The extreme distances of the excavation from the Large Declination Magnet are 59 and 112 feet in a south-westerly direction. If now allowance be made for this change as occurring on the 1st December 1868—for there is evidence that it is gradual—the comparable annual increments will become

TABLE 10.

Year.	From Large Declination Magnetometer.	From Absolute Observations.
1867-68	2′·496	[1′·87]
1868-69	2·693	2·42
1869-70	2·300	1·87
Mean.	2·496	2·09

When each of the three pairs of values bears consistent testimony to the fact that at a height of 38 feet above the ground, where the absolute observations were taken, the secular annual increase of Easterly Declination is considerably less than the corresponding change indicated by the readings of the Large Declination Magnetometer, the magnet of which is suspended at a height of 6 feet above the ground; and it is on the average about one-sixth less.

12. This difference must be attributed either to a real difference of secular variation at the two different heights, or else to a progressive change of torsion of the suspension threads of the Declinometer, or to both these causes combined: to determine between the two it would be necessary to disturb the adjustment of the Large Declinometer and make an absolute determination of Declination in its position: and this I think it would be imprudent to do until a satisfactory connection has been obtained between the readings of this instrument and of the new declination magnetograph. Further on it will be seen that similar differences exist in the secular variation and diurnal inequality of Horizontal Force at different heights.

13. *Secular Change at different epochs.*—The mean annual increase of Declination shown above from the readings of the Large Declination Magnetometer from 1866 to 1870 is 2′·512, whilst the mean from the readings of the years 1859 to 1866 (omitting 1861, which was a broken year) is 3′·220: the diminution of 0′·708 corresponds, as to the time in which it was produced, to an interval of 4·9 years. The above remark as to the possibility of the differences of secular change being due to torsion applies also here.

14. The increased regularity in the annual increments shown by the Large Declinometer since 1866 is doubtless attributable to the rectification, in May of that year, of the fault of the reading telescope mentioned in paragraph 7 of Appendix II. Since that rectification, the adjustments of the transit instrument have been repeatedly tested and found to be practically constant: this condition being secured, any irregularities of the Large Declinometer—not of a magnetic nature—must now be attributed to inconstancy of torsion.

15. *Annual Variation.*—The means for the period of three and a half years of Easterly Declination in each month are shown below, both as observed and corrected: the corrections for secular change to reduce the values for each month to the same epoch—April 1, 1869—being at the rate of 9″·7 per month in the former case and 10″·4 in the latter, are also shown; as are likewise the mean monthly values cleared of secular change, and the monthly excesses above the mean of the year.

TABLE 11.

Monthly Mean Values of Absolute Declination—as observed.

Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
Mean Declination	45 53	46 1	46 27	45 1	44 58	44 59	44 33	44 13	44 7	45 43	46 40	46 50	
Correction for Secular Change....................	+ 24	+ 14	+ 5	− 5	− 14	− 24	+ 24	+ 14	+ 5	− 5	− 14	− 24	
Corrected to Epoch April 1, 1869	46 17	46 15	46 32	44 56	44 44	44 35	44 57	44 27	44 12	45 38	46 26	46 26	45 27
Annual Variation	+0 50	+0 48	+1 5	−0 31	−0 43	−0 52	−0 30	−1 0	−1 15	+0 11	+0 59	+0 59	

TABLE 12.

Monthly Mean Values of Absolute Declination—Reduced to Mean Monthly Reading of the Large Declination Magnetometer.

Month.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
Mean Declination	46 10	46 23	46 53	47 13	46 58	47 10	46 8	46 32	46 50	47 5	47 3	47 1	
Correction for Secular Change....................	+ 26	+ 16	+ 5	− 5	− 16	− 26	+ 26	+ 16	+ 5	− 5	− 16	− 26	
Corrected to Epoch April 1, 1869....................	46 36	46 39	46 58	47 8	46 42	46 44	46 34	46 48	46 55	47 0	46 47	46 35	46 47
Annual Variation............	− 11	− 8	+ 11	+ 21	− 5	− 3	− 13	+ 1	+ 8	+ 13	0	− 12	

The two sets of monthly differences represent the annual variation of Declination, first, as affected by the annual variation of the diurnal inequality at the usual observation hour, and secondly, after the elimination of that affection: it is seen at a glance that the effect of the diurnal inequality is to alter both the character and range of the apparent annual variation, raising the range from 0′ 34″ to 2′ 20″, and impressing upon the variation high values during the winter and low values during the summer months—effects quite consistent with the known character of the annual variation of diurnal inequality. The true (corrected) annual variation has a systematic character, with a double oscillation in the period, showing maxima near the times of the equinoxes, and minima about the times of the solstices.

16. That the Declination is greater near the equinoxes than near the solstices may also be shown without assuming a value for the annual secular change; for if this change be uniform the means for the months January and December, February and November, &c......June and July, will all correspond to the same epoch, and be directly comparable: these means are as follows:—

January and December	46′	35″
February and November	46	43
March and October	46	59
April and September	47	1
May and August	46	45
June and July	46	39

the large values occurring in the middle of the column near the time of the equinoxes. The mean for the months April to September is 46′ 48″ and that for the months January to March and October to December 46′ 46″—showing a scarcely appreciable amount of semi-annual inequality.

17. *Similarity of Regular Annual Variation and Disturbance Annual Variation.*—The annual variation of Declination, just deduced, is somewhat similar to the disturbance annual variation: for referring to Table VII. of Appendix II., we find the aggregates of Easterly and Westerly disturbances, exceeding 1′·4 in amount, during the seven years 1859 to 1865, in the several months, as follows:—

TABLE 13.

Aggregates of Disturbances.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Easterly. Westerly.	′ 304·347 198·089	′ 323·306 150·901	′ 465·344 209·485	′ 376·052 289·836	′ 207·107 224·211	′ 264·433 183·258	′ 428·079 409·885	′ 592·799 288·258	′ 434·502 234·283	′ 551·198 293·979	′ 144·255 91·034	′ 247·163 118·117	
Easterly *minus* Westerly.	+106·258	+172·405	+255·859	+86·216	−17·104	+81·175	+18·194	+304·541	+200·219	+257·219	+53·221	+129·046	
Do. do. $\div \frac{50,736}{12 \times 60}$	″ +1·5	″ +2·4	″ +3·6	″ +1·2	″ −0·2	″ +1·2	″ +0·3	″ +4·3	″ +2·8	″ +3·7	″ +0·8	″ +1·8	″ +2·0
Disturbance Annual Variation in Seconds.	−0·5	+0·4	+1·6	−0·8	−2·2	−0·8	−1·7	+2·3	+0·8	+1·7	−1·2	−0·2	

The number of hourly observations in the period of seven years being 50,736 the effect of the aggregate excess of Easterly disturbance, expressed in seconds, upon the monthly mean values of Declination is found by dividing the excess, in minutes, by $\frac{50,736}{12 \times 60}$.

In the following table the monthly excesses over the yearly means and the quarterly means of those excesses are shown side by side for the two annual variations:—

TABLE 14.

Month.	Annual Variations.			
	Regular.	Disturbance.	Regular.	Disturbance.
	″	″	″	″
November	0	−1·2	−7·7	−0·6
December	−12	−0·2		
January	−11	−0·5		
February	− 8	+0·4	+8·0	+0·4
March	+11	+1·6		
April	+21	−0·8		
May	− 5	−2·2	−7·0	−1·6
June	− 3	−0·8		
July	−13	−1·7		
August	+ 1	+2·3	+7·3	+1·6
September	+ 8	+0·8		
October	+13	+1·7		

The character of the two annual variations is the same, in that they have coincident turning points and a double fluctuation in the year; but whilst the oscillations are equal in the regular variation and of several times the magnitude of the oscillations in the disturbance variation, the latter are also of unequal magnitude; the absolute periods to which they have reference are, however, the years 1867 to 1870 and 1859 to 1865 respectively.

18. *Effect upon Annual Variation of allowance for a Variation with height above the ground.*—If in correcting the observed Declination to the mean of the month only five-sixths of the change observed by the Large Declinometer was allowed, the absolute Declination for the mean epoch April 1, 1869 would become 46′ 34″ East, and the monthly excesses—from January to December respectively—over the annual mean, which represent the Annual Variation of Declination, as follows:—

—1″; + 2″; + 20″; + 12″; — 12″; — 11″; — 15″; — 9″; —6″; +13″; +10″; 0″.

The corresponding quarterly and half-yearly excesses are

From February to April	+ 11″
„ May to July	− 13
„ August to October	− 1
„ November to January	+ 3
„ May to October	− 7
„ November to April	+ 7

There seems to be no reason for presuming that this is less likely to be the true variation,—except that it is of less simple character, and that it introduces a semi-annual inequality of about 7″,—than that derived from the observations after allowance for the full amount of difference of Declination on the ground floor. There is little doubt, however, regarding the systematic character of the annual variation found from the absolute observations, that the irregularities exhibited in the annual variation derived from the differential observations with the large Declinometer (see Appendix II., page 233) are caused by variations of torsion.

19. *Probable error.*—The probable error of a single determination of absolute Declination has been calculated separately for each of the years 1868 to 1870. The numbers of observations made in those years are 53, 53, and 57 respectively, and each one was reduced to the constant

reading 35·00 of the Large Declination Magnetometer. If there was no error of observation, and if the Large Declination Magnetometer was perfect, these reduced values ought all to be alike, and the degree of accordance existing amongst them will indicate the extent to which these conditions are fulfilled. The differences being taken for each year between each individual reduced value of the Declination and the mean of all the values for that year, the probable error of a single determination was found from these differences by the usual method (of least squares) to be ± 22″· 5; ± 22″·0; and ± 15″·4 for the years 1868, 1869 and 1870 respectively; and the probable error of the annual means to be ± 3″·1; ± 3″·0 and ± 2″·0 respectively. As no allowance was made for the change in November and December 1868, of the reading of the Large Declination Magnetometer, without any corresponding and equal change of absolute Declination at the top of the Electrometer Tower, the probable errors for 1868 are slightly, and only slightly, greater than they would have been if such allowance had been made.

The above probable errors of the annual means which include only observational errors, are considerably smaller than the maximum probable error of constants used in the reductions, as may be inferred from the determination of the azimuth of the Tardeo Chimney, an account of which is given on page li of the "Introduction."

III.—Horizontal Force.

20. *Monthly Mean Values.*—In Table 15 are collected the mean monthly values, as observed, of the Horizontal Force, for the period from July 1867 to December 1870, and the corresponding monthly mean readings of the Large Horizontal Force Magnetometer, corrected to the constant temperature 82° Fahrenheit. In correcting the magnetometer readings 0·15 has been adopted as the increase of reading produced by an increase of 1° of temperature.

TABLE 15.

Month.	Mean observed Absolute Horizontal Force.				Corresponding Mean Scale Reading of Large Horizontal Force Magnetometer. Corrected to Temperature 82°·o.			
	1867.	1868.	1869.	1870.	1867.	1868.	1869.	1870.
January		8·0608	8·0616	8·0655		24·60	24·30	24·77
February		8·0556	8·0688	8·0670		24·61	24·07	24·72
March		8·0597	8·0655	8·0758		24·48	24·29	25·26
April		8·0595	8·0616	8·0697		23·79	24·34	24·90
May		8·0614	8·0547	8·0706		24·32	24·09	25·49
June		8·0668	8·0683	8·0818		24·54	24·84	25·62
July	8·0494	8·0651	8·0695	8·0756	23·53	24·07	24·84	25·21
August	8·0612	8·0490	8·0633	8·0768	23·41	24·15	24·25	25·15
September	8·0508	8·0546	8·0710	8·0700	23·37	23·29	24·31	24·35
October	8·0569	8·0637	8·0646	8·0687	23·32	24·10	24·45	24·56
November	8·0523	8·0659	8·0690	8·0680	24·09	24·51	24·48	24·73
December	8·0593	8·0588	8·0625	8·0787	24·27	24·42	24·74	25·59

Table 16 corresponds with Table 15 except that the mean monthly readings deduced from all the hourly observations of the Large Horizontal Force Magnetometer are given instead of those which correspond to the times of the absolute observations only, and the values of Horizontal Force are corrected for the difference between the two sets of mean monthly readings so as to represent the *mean* Horizontal Force for the several months. The scale-coefficient adopted for the Large Horizontal Force Magnetometer is $\frac{d\,X}{X} = \cdot 001488$; and X being $= 8\cdot 0643$, $d\,X = + \cdot 012$ for an increase of unity in the scale reading.

TABLE 16.

Month.	Monthly mean Absolute Horizontal Force reduced to Monthly Mean Reading of Large Horizontal Force Magnetometer.				Monthly Mean Reading of Large Horizontal Force Magnetometer, corrected to Temperature 82°·0.			
	1867.	1868.	1869.	1870.	1867.	1868.	1869.	1870.
January		8·0556	8·0584	8·0581		24·17	24·03	24·15
February		8·0491	8·0680	8·0610		24·07	24·00	24·22
March		8·0551	8·0629	8·0654		24·10	24·07	24·39
April		8·0606	8·0552	8·0627		23·88	23·81	24·32
May		8·0578	8·0524	8·0611.		24·02	23·90	24·70
June		8·0602	8·0592	8·0708		23·99	24·08	24·70
July	8·0480	8·0617	8·0613	8·0702	23·41	23·79	24·16	24·76
August	8·0593	8·0444	8·0580	8·0672	23·25	23·77	23·81	24·35
September	8·0473	8·0568	8·0619	8·0642	23·08	23·47	23·55	23·87
October	8·0547	8·0573	8·0576	8·0604	23·14	23·57	23·87	23·87
November	8·0487	8·0612	8·0671	8·0630	23·79	24·12	24·32	24·31
December	8·0564	8·0554	8·0582	8·0685	24·03	24·14	24·38	24·74

21. *Annual Mean Values, and Secular Change.*—The mean value of the Horizontal Force for the epoch April 1, 1869, is 8·0643 or 8·0591, according as the observations are uncorrected or corrected to the mean of the several months.

The following table shows the mean values, uncorrected and corrected, of the Horizontal Force in each year or half year from 1867 to 1870, and the corresponding annual increments of Horizontal Force:—

TABLE 17.

Year or Half-year.	As observed.		Corrected to Mean Reading of Large Horizontal Force Magnetometer.	
	Horizontal Force.	Annual Increment.	Horizontal Force.	Annual Increment.
1867, July to December	8·0550		8·0524	
1868, Do.	8·0595	[+·0045]	8·0561	[+·0037]
1868, January to December	8·0601		8·0563	
1869, Do.	8·0650	+·0049	8·0600	+·0037
1870, Do.	8·0723	+·0073	8·0644	+·0044
Mean.		+·0048		+·0040

The annual increments within brackets, being derived from *half-yearly* means, are allowed only half the weight of the others. The mean secular change of Horizontal Force is thus found to be a yearly increase of ·0048 from the uncorrected observations, or ·0040 from the corrected observations.

22. *Secular Change at different heights above the ground.*—The observations made with the old Horizontal Intensity apparatus, at a height of 6 feet above the ground give, for the years

1865 to 1868, the values shown below of Horizontal Force and of its annual increase,—the former being taken from Tables I. to IV. of the "Absolute Magnetical Results:"—

TABLE 18.

Year.	Date to which the mean of the year corresponds.	Absolute Horizontal Force. Mean.	Approximate Annual Increment.	Number of months to which the Increment corresponds.	Corrected Annual Increment.
1865	June 15	8·0349	+·0150	12·5	+·0144
1866	July 1	8·0499	+·0110	12·0	+·0100
1867	July 1	8·0609	+·0108	9·0	+·0144
1868	April 1	8·0717			
Sums and mean			+·0368	33·5	+·0132

Only the last period (1867-8) partly corresponds to the first period in Table 17, but the consistent recurrence of large values here, and of values less—on the average—than one-third their amount in Table 17, is difficult to explain on any other supposition than the existence of a real difference in the amount of secular variation at the heights 6 feet and 38 feet. Moreover, the annual values of Horizontal Force for the years 1847 to 1863—with the addition of the value 8·0848 for 1864—given in Table VII. of the "Introduction to the Bombay Observations" for 1863, page x., give values of the average annual increase of force twice as large as is found at the top of the Electrometer Tower, viz:— from 1847 to 1855 an average increase of ·0075 of a unit of force per year, and from 1855 to 1864 an average increase of ·0088 of a unit. And the fact that an increase is shown in all, except one, of the twenty-one years is some evidence that the observations may be trusted for this purpose.

23. *Diurnal Inequality at different heights above the ground.*—In the following table a comparison is drawn between the diurnal inequalities of Horizontal Force at corresponding hours, shown by the absolute observations and by the Large Horizontal Force Magnetometer. The earlier absolute observation was regularly taken about the hour when the Horizontal Force is a maximum and the later observation generally a little more than two hours later.

TABLE 19.

Half-yearly Period.	Civil Time of				Horizontal Force deduced from		Large Horizontal Force Magnetometer at				Excess of First over Second Result.	
	First		Second		First	Second	First		Second			
	Observation.				Observation.		Observation.					
	h.	m.	h.	m.	English Units.		Scale Reading.	Thermometer.	Scale Reading.	Thermometer.	By Absolute Determinations.	By Large Horizontal Force Magnetometer.
1867 July to December	12	16	14	44	8·0573	8·0552	23·62	83·4	23·23	84·0	+·0021	+·0036
1868 Do.	12	48	14	49	8·0613	8·0578	23·95	83·7	23·63	84·2	+·0035	+·0030
1869 Do.	12	30	14	38	8·0683	8·0652	24·36	84·2	23·92	84·7	+·0031	+·0043
1870 Do.	12	20	14	40	8·0762	8·0697	25·08	83·1	24·38	83·6	+·0065	+·0074
Mean Do.	12	28	14	43							+·0038	+·0046
1868 January to June	12	18	14	24	8·0652	8·0632	24·42	83·1	24·09	83·7	+·0020	+·0028
1869 Do.	12	37	14	49	8·0661	8·0611	24·24	84·0	23·74	84·7	+·0050	+·0047
1870 Do.	12	12	14	27	8·0743	8·0703	25·19	83·4	24·55	84·3	+·0040	+·0060
Mean Do.	12	22	14	33							+·0037	+·0045
1868 January to March and October to December	12	39	14	46	8·0626	8·0592	24·62	81·6	24·29	82·5	+·0034	+·0023
1869 Do.	12	43	14	54	8·0678	8·0627	24·56	82·4	24·00	83·2	+·0051	+·0053
1870 Do.	12	20	14	31	8·0736	8·0679	25·21	81·9	24·59	82·8	+·0057	+·0061
Mean Do.	12	34	14	43							+·0047	+·0046
1868 April to September......	12	28	14	28	8·0638	8·0617	23·75	85·1	23·44	85·4	+·0021	+·0031
1869 Do.	12	24	14	33	8·0666	8·0636	24·02	85·9	23·65	86·4	+·0030	+·0036
1870 Do.	12	12	14	32	8·0769	8·0721	25·07	84·6	24·35	85·1	+·0048	+·0078
Mean Do.	12	21	14	31							+·0033	+·0048

The temperature and scale coefficients used in calculating the numbers in the last column from those in columns 6 to 9 have been already given.

The general result—with which ten half-yearly differences are in agreement and three of contrary import—is that the diurnal variation of Horizontal Force is, between the hours in question, less in the top room of the Electrometer Tower, at a height of 38 feet above the ground, than it is at a height of 6 feet, where the Large Horizontal Force Magnetometer is placed; and, on the average, it is about one-sixth less. The close agreement of this result with that found for the corresponding differences in secular change of Declination, both in direction and in average amount, and the agreement in direction of that found for secular change of Horizontal Force, is remarkable.

24. *Diminution of Terrestrial Magnetic Action with increase of height above the ground.*—I am aware that experiments have at times been made to determine the effect upon the terrestrial magnetic force, of change of elevation or depression, both upon mountains and in mines; and it may be that such have been made also upon high buildings: but excepting the observations made in the vaults of the Paris Observatory, which I have not seen any discussion of with reference to this point, I believe that no long series of observations—capable of detecting small differences of the kind now pointed out—have been made elsewhere than at Bombay; and that the facts so strongly brought to light by the Bombay observations have not previously been forcibly commented on. It has now been shown—by the discussion of *independent* observations in each case—that diminution of effect with increase of height extends to—

1st. The Secular Variation of Declination.
2nd. Do. do. Horizontal Force.
and 3rd. The Diurnal Inequality of ditto.

Consistent testimony of this kind—even allowing for the possibility of explaining the first case on a different hypothesis—gives probability to the supposition that the phenomenon of sensible diminution of terrestrial magnetic action with moderate and practically attainable elevations above the earth's surface is *general.*

25. *Annual Variation.*—In Table 20 are shown the means for each month, in the period of three and a half years, of the values of Horizontal Force corrected to the mean monthly reading of the Large Horizontal Force Magnetometer; also the corrections for secular change,—at the rate of + ·0040 per year or + ·00033 per month—to reduce those means to the common epoch April 1, 1869, and the same means cleared of secular variation; and further the excess of each of the corrected monthly values above the mean value for the year,—the last series of numbers representing the annual variation of Horizontal Force:—

TABLE 20.

Months.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Mean Horizontal Force	8·0574	8·0594	8·0611	8·0595	8·0571	8·0634	8·0603	8·0572	8·0575	8·0575	8·0600	8·0596	
Correction for Secular Change	+ 8	+ 5	+ 2	− 2	− 5	− 8	+ 8	+ 5	+ 2	− 2	− 5	− 8	
Corrected to epoch April 1, 1869	8·0582	8·0599	8·0613	8·0593	+8·0566	8·0626	8·0611	8·0577	8·0577	8·0573	8·0595	8·0588	8·0592
Annual Variation	−·0010	+·0007	+·0021	+·0001	−·0026	+·0034	+·0019	−·0015	−·0015	−·0019	+·0003	−·0004	

The annual variation exhibits a semi-annual inequality in which the horizontal force is during the months February to July ·0010 greater than the mean of the year, and during the months August to January ·0010 less. The quarterly means that give the greatest differences are as follows:—

February to April	+·0010
May to July	+·0009
August to October	−·0016
November to January ...	−·0004

26. *Effect upon Annual Variation of allowance for a Variation with height above the ground.*—If, on the supposition that the variations of Horizontal Force are one-sixth less where the absolute observations were taken than at the place of the Horizontal Force Magnetometer, allowance be

made for corrections one-sixth too great having been applied to the monthly means of the absolute observations, no sensible effect will be produced upon the annual variation just found, for the annual variation of the excess corrections applied has monthly differences of only the following small magnitudes, viz.:—from January to December respectively ·0000; + ·0001; – ·0001; + ·0002; ·0000; – ·0006; + ·0001; ·0000; + ·0002; – ·0001; + ·0002; and ·0000. But the effect of such allowance on the absolute mean horizontal force corresponding to the epoch April 1, 1869 is to reduce it from 8·0591 to 8·0582.

27. *Annual Variation_continued.*—Without applying any corrections for secular change the means of the values of Horizontal Force, in Table 20, for January and December, February and November, &c., will all correspond to the same epoch April 1, 1869. Such means are compared below both for the uncorrected observations, and for the observations corrected to the mean of each month.

TABLE 21.

Months.	Uncorrected.		Corrected.	
January and December	8·0637	8·0637	8·0585	8·0591
February and November	8·0638		8·0597	
March and October	8·0652	8·0639	8·0593	8·0589
April and September	8·0626		8·0585	
May and August	8·0624	8·0655	8·0571	8·0595
June and July	8·0686		8·0618	
April to September		8·0645		8·0592
October to March		8·0642		8·0592

Both sets of numbers agree as to the absence of any sensible semi-annual inequality as between the half years April to September and October to March: and the four-monthly means show a range three times as great in the uncorrected as in the corrected observations: as in the corresponding differences in the annual variations of Declination, so here, this is doubtless due to the annual variation of the diurnal inequality of Horizontal Force at the usual observation hours, which in the case of the uncorrected observations, has not been eliminated.

28. *Probable Error.*—The probable error of a single weekly determination of Absolute Horizontal Force has been computed separately for July to December 1867, and for the year 1868. This has been done independently from all the complete observations except those of July 2 to 27, 1867,—and for all with the further exception of those of August 21, 1867, and April 8 and 15 and August 19, 1868, which give results that are evidently erroneous—for some reason that has already been explained or else is unknown—far beyond the range of observational error. The observations were all reduced to the constant reading 24·27, at temperature 82°, of the Large Horizontal Force Magnetometer, allowance being further made for the loss of strength of the magnet of that instrument; and the differences being then taken between each corrected determination and the mean of all, the probable errors were calculated from these differences by the method of least squares. The rate at which allowance was made for the loss of strength of the magnet was ·00015 of the whole per annum: (see "Introduction to Observations of 1864," page xvi). The probable errors found are as follows:—

TABLE 22.

Period.	Including abnormal values.		Excluding abnormal values.	
	English Units of Force.			
	Of a single weekly determination.	Of the mean of all the determinations.	Of a single weekly determination.	Of the mean of all the determinations.
July to December 1867	±·0053	±·0011	±·0043	±·0009
January to December 1868	±·0067	±·0009	±·0043	±·0006

The remaining observations of 1869 and 1870 being of about the same quality as those of 1868, will have about the same probable error.

The maximum probable error (that of the moment of inertia of the vibration magnet) of the constants used in reductions of the Horizontal Force observations has about the same effect (±·0006) as the smallest of the above determinations which have reference to observational errors only.

IV.—Total Force.*

29. With the following data :—

Dip—for epoch 1st October 1868 .... = $19^\circ 4'{\cdot}2$
Secular change of Dip—per annum .... = $+\ 1'{\cdot}9$
Semi-annual inequality of Dip :—excess from April to September above the mean of the year .... = $+\ 0'{\cdot}3$
Horizontal Force—for epoch 1st April 1869 .... = 8·0591
Secular change of Horizontal Force—per annum .... = +·0040
Semi-annual inequality of Horizontal Force .... = ·0000

We find—

Dip for epoch 1st January 1869 .... $= 19^\circ 4'{\cdot}2 + \frac{1'{\cdot}9}{4}$
Horizontal Force for epoch 1st January 1869 .... $= 8{\cdot}0591 - \frac{{\cdot}0040}{4}$

And by the formula $R = \frac{X}{\cos\theta}$, where R represents the Total Force, X the Horizontal Force, and θ the Dip—

Total Force for epoch 1st January 1869 .... = 8·5264

And by the Formula $dR = \frac{dX}{\cos\theta} + R \tan\theta \, d\theta$

Secular change of Total Force per annum .... = + ·0059
Semi-annual inequality of Total Force :— excess from April to September over mean of the year .... } = + ·0003

30. *Annual Variation.*—In the annual variation of Total Force, derived, by the formula last given, from those of Dip and Horizontal Force in Tables 3 and 20, the monthly excesses above the yearly mean are for January to December respectively, as follows : – ·0017 ; +·0006 ; +·0021 ; +·0004 ; –·0022 ; +·0039 ; +·0022 ; –·0012 ; –·0015 ; –·0020 ; +·0002 ; and –·0010 ; and the quarterly means which give the greatest differences are—February to April, +·0010 : May to July, +·0013 : August to September, – ·0016 : and November to January, – ·0008.

V.—Absolute Magnetical Results.

*Collected together.**

TABLE 23.

Magnetic Element.	Epoch.	Value at Epoch.	Value at common Epoch 1st January 1869.	Secular change per annum.	Semi-Annual inequality :—excess of April to September over mean of year.	
		° ′ ″	° ′ ″			
Declination	1st April 1868 ...	0 46 47 E	0 48 36 E	+2′ 5″	+1″	
Dip	1st October 1868 .	19° 4′·2	19° 4′·7	+1′·9	+0′·3	
Horizontal Force	1st April 1869 ...	8·0591	8·0581	+·0040	·0000	In English units
Total Force	1st January 1869 .	8·5264	8·5264	+·0059	+ ·0003	Do.

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* The results for Declination and Horizontal Force being derived from observations taken at a height of 38 feet above the ground, and those for Dip from observations taken at a height of 5 feet, the calculated results, for Total Force, as applying to a height of 38 feet, will be subject to correction if it should be found hereafter that the Dip varies with height.

convenient range might easily be secured. It is best, however, to keep the exposed surface of the funnel as small as is consistent with accuracy, because the limit of the capacity of a syphon which will work satisfactorily is soon reached, and the less the quantity of water to be discharged, the more quickly it is accomplished.

The object of making the capacity of *C* (fig. 1) so much larger than that of the tube *T*, is to secure a large range of the column of mercury in *T*: had *C* and *T* both been the same in capacity, any difference of level in the surface of the mercury in *C* and *T* produced by the pressure of the water, would have been divided equally between the two, the mercury in *C* being just as much depressed as that in *T* was raised; but as the capacity of *C* is made sixteen times larger than that of *T*, $\frac{16}{17}$ of any change of level will take place in *T* and only $\frac{1}{17}$ in *C*. The object of making the tube *t* of narrow bore, is to reduce the effect of change of temperature in altering the height of the column in *T* to an inappreciable amount, and the column in *T* is made as short as possible for the same reason. The pipe *p* is continued nearly to the bottom of the receiving vessel to prevent splashing, and also to prevent any particles of solid matter from falling into *C*. The receiving vessel *R* and the tube *T* are provided with covers that keep out dust, but do not obstruct the ingress or egress of the air.

Fig. 3 is a fac-simile of a curve obtained from a rain-gauge of the above description—but of different dimensions—which has been in successful operation at the Bombay Observatory nearly the whole of the past monsoon. The scale is much larger than is absolutely needful, a change of one inch in the ordinates of the photographic curve being equal to a fall of 0·535 of an inch of rain.

Government Observatory, Bombay,
19*th October* 1871.

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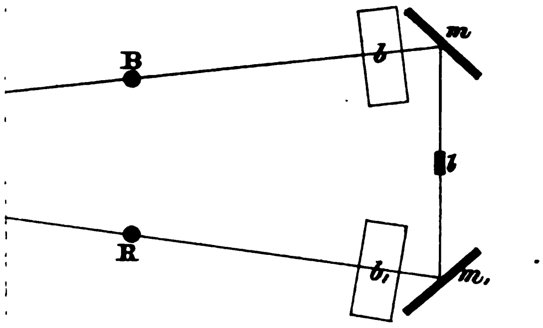
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